

# OPERATION MANUAL



## KIJIMI MK2

8-VOICE ANALOGUE SYNTHESIZER  
BY BLACK CORPORATION

1.4.6

## **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.

## **EUROPEAN UNION REGULATION COMPLIANCE STATEMENT**

This product complies 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 product must be disposed of properly according to local laws and regulations.

## **IMPORTANT SAFETY INSTRUCTIONS**

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of a polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped

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# INTRODUCTION

Thank you for purchasing KIJIMI MK2, 8-voice, 16 oscillator analogue polyphonic synthesizer!

The unique architecture of KIJIMI MK2 features smoothly variable waveforms on each fully analogue oscillator, a rich SSI2140 lowpass filter, and a wealth of deeply programmable modulators. This makes it one of the most powerful polyphonic analog synthesizers ever made. In addition, modern performance controls including polyphonic aftertouch and MIDI polyphonic expression (MPE) allow for even greater expression and experimentation leading to an exciting realm of sonic exploration. We hope that KIJIMI will bring you many years of inspiration, weirdness, and fun!

## PACKAGE CONTENTS

When unpacking your KIJIMI MK2, check to make sure all of the following contents are present, and nothing has been lost or damaged in shipping. It may be helpful to save the packaging to protect the unit when transporting it. If you have any questions, feel free to contact us at [support@black-corporation.com](mailto:support@black-corporation.com).

### **KIJIMI MK2 ships with the following items:**

#### **BUILT**

- KIJIMI MK2 Desktop Analogue Synthesizer
- 12.0V 2.5A 30W wall wart power supply with US/JP, UK, EU, and AU local adapters.
- Rack Ears and Mounting Screws (Caution: Use the screws provided in the bag or you will damage your unit!)
- 4 Self-Adhesive Felt Pads
- Black Corporation Logo Stickers

#### **DIY (discontinued)**

- Motherboard and Hardware board with MCU and DACs installed, 8 x Voice boards, 1 x PSU board, 1 x Breakout board.

Please check <https://www.dsl-man.de/display/KIJIMI/KIJIMI+Documentation> for the most up to date information on the KIJIMI DIY build.

## FEATURES AND SPECIFICATIONS

Polyphony: 8 voices

Oscillators: 16 (2 per voice)

Oscillator Type: Voltage controlled analog oscillators

Oscillator Frequency Range: 10Hz to 12.5kHz

Oscillator Waveshapes: Triangle, Saw, Square and variable Pulse

ADSR1 and ADSR2: Attack time: 2ms - 10s

Decay time: 2ms - 10s

Sustain level: 0-100%

Release time: 2ms - 10s

Modulations: Complex modulation matrix

Low Frequency Oscillators MIDI syncable, independent LFO per destination

(LFO): Waveforms: Sine, Triangle, Saw, Ramp, Square, Random

Destinations: VCO 1 and 2, OSC Waveform 1 and 2, Sub

Oscillator, LPF, Resonance and VCA

Controls: Rate, Depth, Attack and Decay

Rate: 0.01Hz - 100Hz

Filter: Range: 10Hz - 20kHz

Filter Type: 24 db/oct, Low Pass with self-oscillation

Filter Modulations: LFO 1 and 2, Velocity, Aftertouch, Envelope, Keyboard tracking

Preset Memory: 128 factory and 1152 user presets – User banks by Paul Schilling, Nicky Benedek and DZA, Sarah Shachner and Kyle Moorman.

Keyboard Touch Response: Velocity, Aftertouch (Channel and Polyphonic), MPE

Connections: MIDI IN/OUT/THRU, Balanced Audio Output, USB (isolated), Headphones

Power: +12VDC, 2.5A

Dimensions: 460 W, 175 H, 50 D (mm) (Wood panels attached)

Weight: ~ 2.710 kg / 5.97 lbs

## ARCHITECTURE

- SSI2131 (CEM3340 in MK1) Voltage controlled oscillators (VCOs) with continuously variable waveforms (variable pulse waveform at one end of the waveform spectrum), sub-oscillator.
- SSI2140 (SSM2044 in MK1) 24dB low-pass (LP) voltage-controlled filters (VCF) with velocity and (polyphonic) aftertouch control of both cutoff and resonance, all with dedicated knobs
- Two Attack/Decay/Sustain/Release (ADSR) envelopes with cycle mode, dedicated rate multiplier button, and optional keyboard control of Attack rate
- Two LFOs (switchable between mono and poly modes), each with Attack/Decay EG knobs, and selectable sine, triangle, saw, ramp, square and random (S&H) waveforms
- The LFO modulation matrix gives each LFO a separate routing button to VCO1&2 frequencies and waveforms, sub oscillator amount, LPF cutoff and resonance and VCA amplitude. Each button is switchable between positive, negative, or bi-polar modulation
- The ADSR2 routing matrix has routing buttons to VCO1 and VCO2 frequencies and waveforms. Each button is switchable between positive, negative, or bi-polar modulation
- Dedicated modulation knobs for VCO2->VCO1 frequency modulation and VCO2->VCF frequency modulation
- Dedicated modulation knobs for Velocity routing to: LFO1 and LFO2 rates and amplitudes, VCO1 and VCO2 waveform morph, sub-osc amount, pitch bend and VCA amplitude
- Dedicated modulation knobs for (polyphonic) Aftertouch routing to: LFO 1 and LFO2 rates and amplitudes, VCO 1 and VCO2 waveform morph, sub-osc amount, pitch bend and VCA amplitude



# SETUP AND CONNECTIONS

## POWER

Connect an IEC cable to the DC power brick. Insert the barrel end of the power supply into the input labeled **POWER 12VDC** on the back of the unit. Plug the other end of the power supply into an AC outlet. Note that it may take a few minutes for the oscillators to warm up and reach stable tuning.

## MIDI CONNECTIONS

Because KIJIMI is a rack-mount synthesizer with no onboard keyboard or sequencer, an external **MIDI** controller must be used to control the unit. KIJIMI can be controlled with standard hardware **MIDI** controllers, or for more expressivity, a polyphonic aftertouch controller or **MIDI Polyphonic Expression (MPE)** controller. See the **SETTINGS** section of the manual for information on how to configure the unit for each type of controller.

KIJIMI can also be controlled by external hardware sequencers, or over **USB** with a **Digital Audio Workstation (DAW)**.

## DIN MIDI

To control KIJIMI with a controller that uses a **DIN5 MIDI** output, connect a midi cable from the output of the controller to the jack labeled MIDI IN on the back of the unit.

If desired, **MIDI** signals can be passed through the unit to another device by connecting a **MIDI** cable to the jack labeled **MIDI THRU** on the back of the unit to the input of another device in the midi chain.

- **MIDI IN:**Receive MIDI data.
- **MIDI THRU:** Allowing the chaining of multiple instruments and maintaining the signal flow within a MIDI setup.
- **MIDI OUT:** Mainly used for data exchange with computer programs like Babu Frik.

## USB MIDI

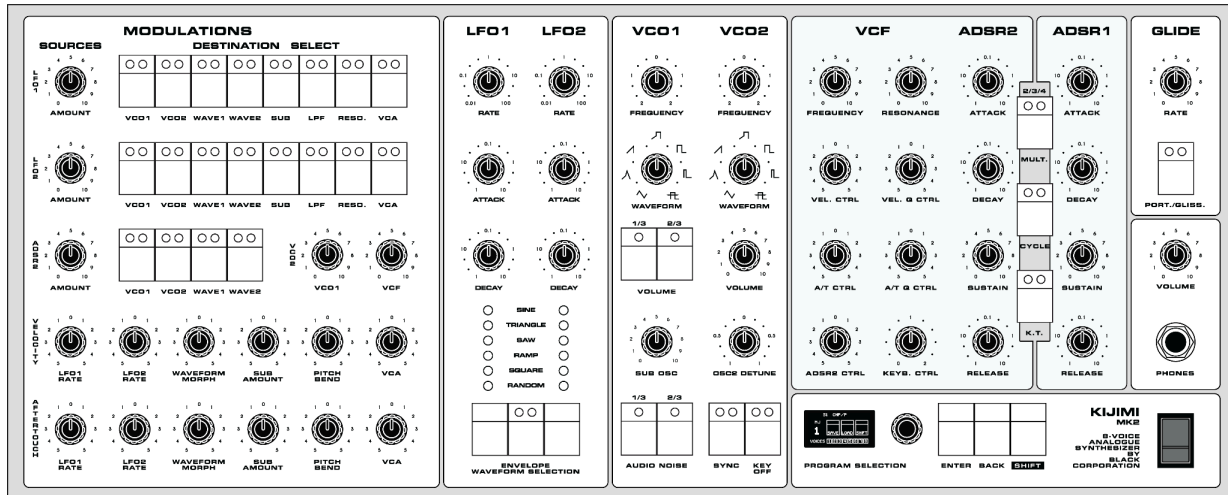
To control KIJIMI with a computer, use a **USB** cable appropriate for your computer or **USB HUB** to **USB-B**. Connect the appropriate end of the cable to a computer, and the **USB-B** end of the cable to the **USB** input on the back of the unit.

You can connect the KIJIMI MK2 to your computer using a USB-B cable. This way, in your DAW settings, you can see the KIJIMI as a device to which you can send and receive MIDI signals.

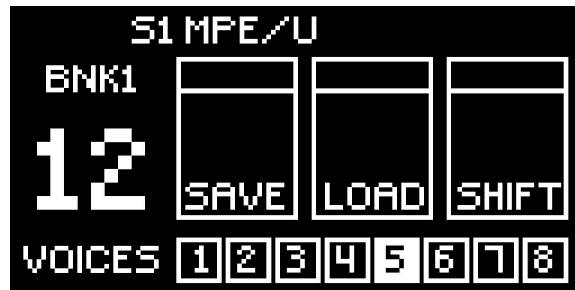
Every encoder and button on the synthesizer sends MIDI signals, which can be useful when using an external VST patch editor like Babu Frik developed by Rita & Aurora.

<https://ritaandaurora.github.io/KIJIMI-babu-frik>

# PANEL LAYOUT



KIJIMI is designed to be intuitive and straightforward. Most of the functionality can be easily controlled in real time using the buttons and knobs on the front panel. For some buttons, the current selection is indicated with a row of lights next to the button. Others serve multiple functions as indicated by a combination of lights on that button. However, it should be noted that certain functions, such as Multiple LFO, etc., need to be activated through the user menu.

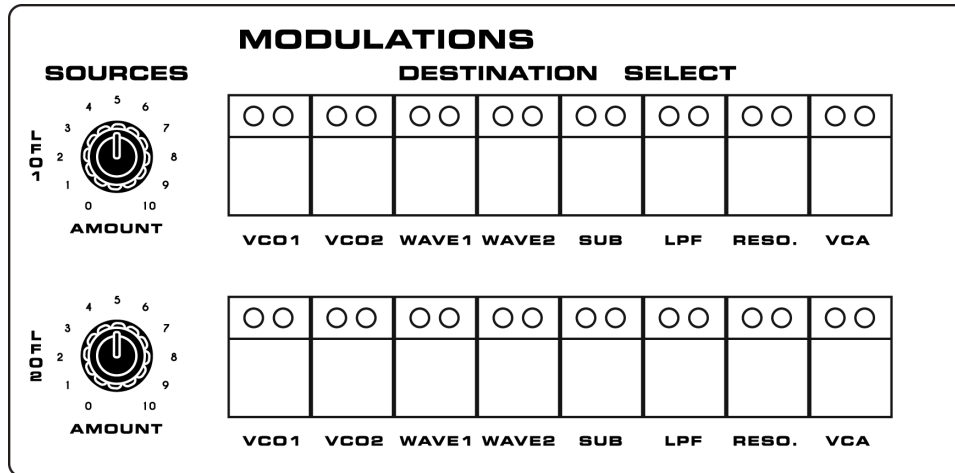


As with other BLACK CORPORATION synthesizers, the menu on KIJIMI MK2 is quite straightforward, and all items are easy to understand. On the main screen, at the top, there are labels such as **S1 MPE/U**, which indicate the **VOICE** and **MIDI** settings.

In this case, **PLAYBACK - SUSTAIN 1**, **MIDI MODE - MPE**, and **VOICE MODE - UNISON**.

Holding down the **SHIFT** button allows you to enter the settings menu and select a preset bank.

# MODULATIONS

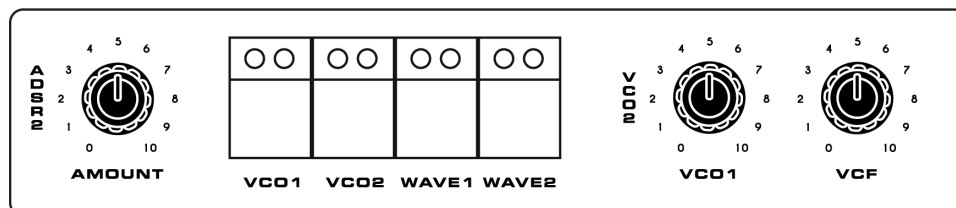


The modulation matrix provides a powerful interface for shaping and evolving the sound of a synthesizer by allowing users to define and control the relationships between modulation sources and destinations.

The first two rows of buttons are related to control using **LFO1** and **LFO2**.

## LFO1/LFO2 DESTINATION:

- **VCO1:** frequency modulation of VCO1
- **VCO2:** frequency modulation of VCO2
- **WAVE1:** waveform modulation of VCO1
- **WAVE2:** waveform modulation of VCO2
- **SUB:** sub OSC amount
- **LPF/VCF:** cutoff frequency modulation
- **LPF/VCF:** resonance modulation
- **VCA:** amplitude modulation



## ADSR2 AND VCO2 DESTINATION

The next row controls using **ADSR2**, and **VCO2**. The envelope controls the **VCO** and **WAVE** on both generators as follows:

**RED:** negative envelope modulation

**GREEN:** positive envelope modulation

**BOTH:** 2x positive envelope modulation

- **VCO1:** frequency modulation of VCO1
- **VCO2:** frequency modulation of VCO2
- **WAVE1:** waveform modulation of VCO1
- **WAVE2:** waveform modulation of VCO2

## VCO2 MODULATION

- **VCO1:** frequency modulation amount of VCO1
- **VCF:** cutoff frequency modulation amount

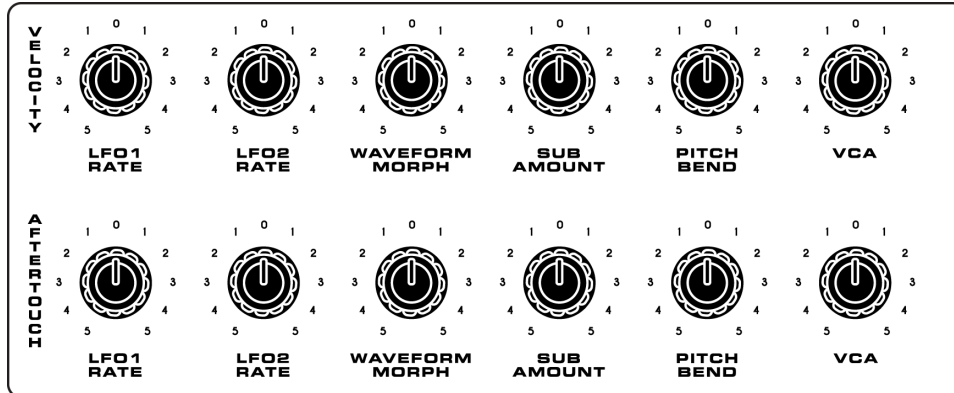


**NOTE:** The buttons with LEDs on the Destination Select of LFO1, LFO2 indicate three values:

- **GREEN:** POSITIVE
- **RED:** NEGATIVE
- **BOTH:** BIPOLAR

It is also worth noting that in the **LFO and ENVELOPE** settings, there are options labeled **COMMON** and **INDIVIDUAL**, which allow you to choose a shared or unique amount value for each destination of **LFO1** or **LFO2**. For more details on this, refer to the **LFO** section of this document.

## VELOCITY & AFTERTOUCH MODULATION



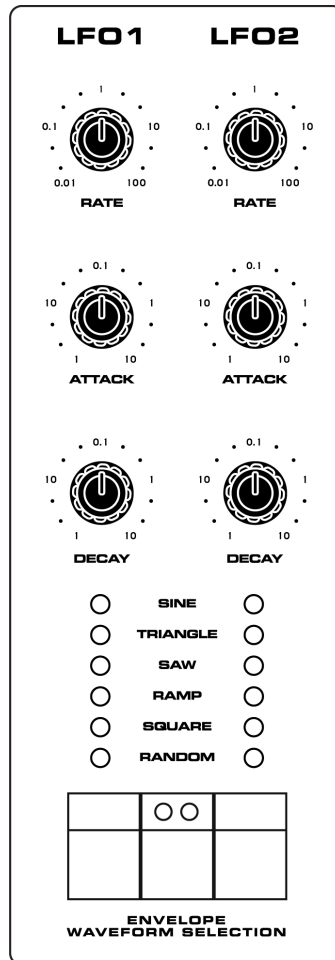
The final control element on the modulation panel is **VELOCITY & AFTERTOUCH MODULATION**. Each potentiometer adjusts the amount of how velocity or aftersustain will affect a specific parameter.

- **LFO1 RATE:** LFO1 rate amount
- **LFO2 RATE:** LFO2 rate amount
- **WAVEFORM MORPH:** VCO1&2 waveform modulation amount
- **SUB AMOUNT:** SUB OSC amount
- **PITCH BEND:** pitch bend amount
- **VCA:** VCA modulation amount



**NOTE:** The pitch can vary within a range of +/- 4 semitones. This means that, for example, with a potentiometer value of 5 and maximum velocity, the pitch will change by +4 semitones.

# LFO



KIJIMI features two separate Low-Frequency Oscillators for versatile modulation possibilities. Each LFO includes the following set of controls:

- **RATE:** LFO rate
- **min.** 0.01Hz
- **max.** 100Hz

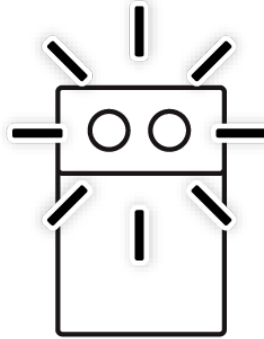
Rates can be adjusted in the **SETTINGS/LFO** menu

- **WAVEFORM SELECTION:** Sine, Triangle, Saw, Ramp, Square, Random

Also, in KIJIMI, there is an **ENVELOPE GENERATOR** function that adjusts the **ATTACK** and **DECAY** times for the selected LFO.

- **LFO ENVELOPE BUTTONS:** LFO1&2 EG on/off
- **RED:** LFO1 EG

- **GREEN:** LFO2 EG
- **OR BOTH** LFO EG are active
- **ATTACK:** EG attack (can control LFO amplitude, rate, or both)
- **DECAY:** EG decay (can control LFO amplitude, rate, or both)



**LPF**

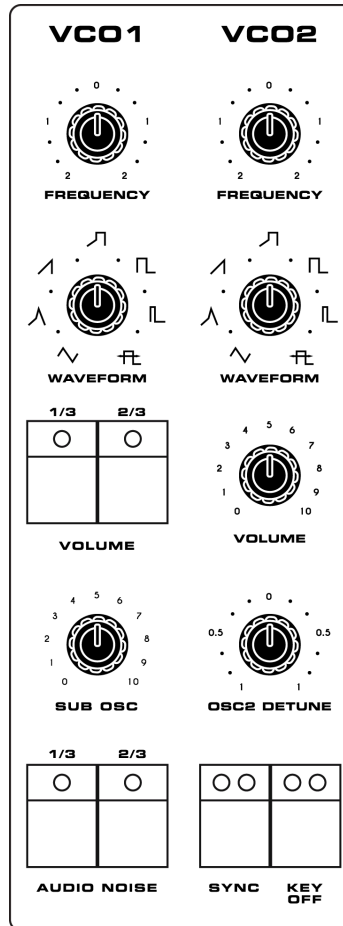
In the **SETTINGS** menu, under **LFO/ MOD MODE**, you'll find two **LFO** operation modes: **COMMON** and **INDIVIDUAL**. The default setting is **COMMON**, where all assignments for a specific **LFO** share the same parameters. Switching to **INDIVIDUAL** mode grants access to unique settings for **RATE**, **DEPTH**, **SHAPE**, and **ENVELOPE GENERATOR** settings for each **LFO** assignment. This powerful feature expands your capabilities, allowing for up to 16 individual **LFOs** instead of 2.



**NOTE:** While in **INDIVIDUAL** mode, press and hold the assignment button for a few seconds. Once it begins flashing, you can customize the settings for the individual **LFO**. Keep an eye on the screen to view the exact values of the parameters you're inputting. After inputting your parameters, press the assignment button once more to cease the flashing and save the configured settings. Now, proceed with selecting the **LFO** direction as usual.



## OSCILLATORS



Every oscillator provides a tuning span of  $\pm 24$  semitones, with **VCO2** featuring a finer tuning range of  $\pm 1$  semitone for crafting typical detuned sounds. Furthermore, a **KEY OFF** button enables disconnection of either **VCO1** or **VCO2**, or both, from the keyboard.

**VCO1** is equipped with a unique volume setup, featuring four levels—off, 1/3, 2/3, and 1—while **VCO2** adheres to a more standard volume control.

### VCO1

- **FREQUENCY:**  $\pm 2$ oct
- **WAVEFORM:** morphs TRIANGLE->SAW->SQUARE, far right=VARIABLE PULSE)
- **VOLUME:** volume 1/3 , 2/3 (both on = 100% volume)

## VCO2

- **FREQUENCY:**  $\pm 2$ oct
- **WAVEFORM:** morphs TRIANGLE->SAW->SQUARE, far right=VARIABLE PULSE)
- **VOLUME:** controls volume of VCO2
- **OSC2 DETUNE:**  $\pm 1$  semitone

## SUB OSCILLATOR

Additionally, a sub-oscillator is found in the VCO1 section, producing a signal one octave lower than the combined outputs of both VCO1 and VCO2. This means the sub-oscillator remains inactive if the main oscillators are silent. However, when both VCOs are engaged and tuned, such as to a root and fifth, the sub-oscillator generates two pitches, mirroring the root and fifth intervals.

## NOISE GENERATOR

Lastly, in the realm of oscillators, there's a white noise generator that, similar to VCO1, allows amplitude adjustments ranging from Off to 1/3, 2/3, and 1.

- **AUDIO NOISE:** Noise volume 1/3 and 2/3 (if both are on = 100% volume)

## SYNC AND KEY OFF

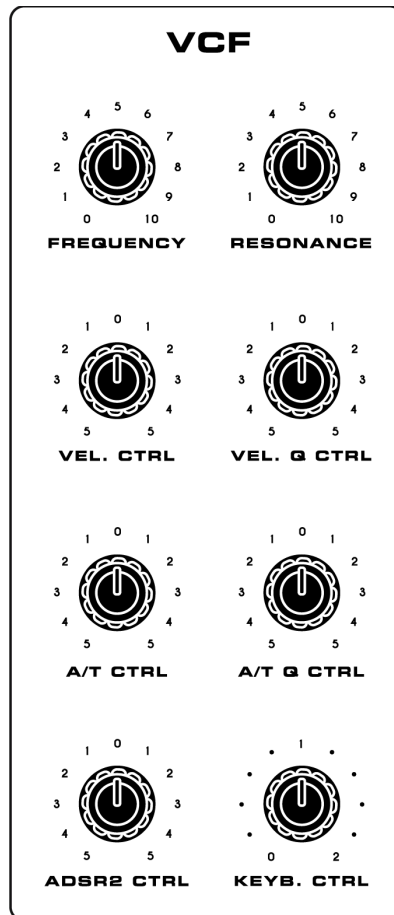
Hard sync is achievable with either oscillator serving as the master. You can synchronize the VCO in various configurations.

- **RED:** VCO1 sync to VCO2
- **GREEN:** VCO2 sync to VCO1

Additionally, there's a Key Off button enabling the disconnection of either VCO1 or VCO2, or both, from the keyboard.

- **KEY OFF:** VCO key follow on/off
- **RED:** VCO1
- **GREEN:** VCO2
- **BOTH:** VCO1 + VCO2

## VCF

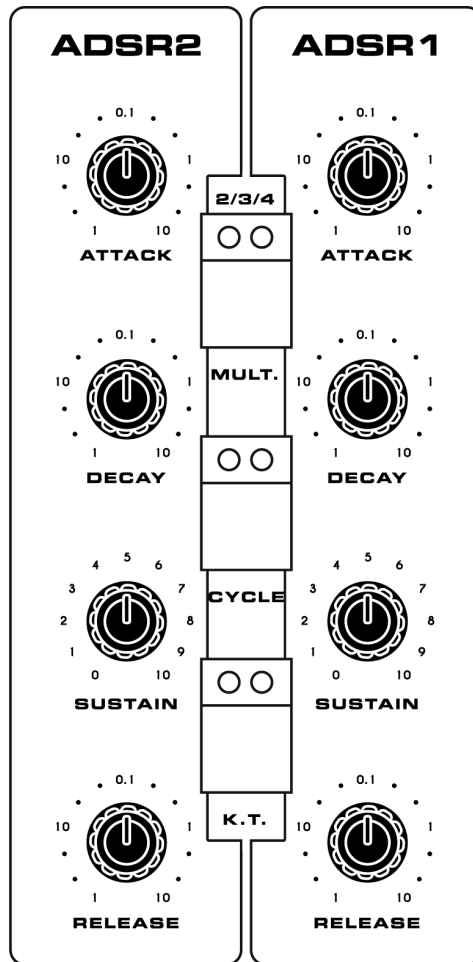


The combined signals from the oscillators in each voice are directed to their respective filter sections. These sections feature a single 24dB/octave low-pass filter equipped with standard frequency and resonance controls, both responsive to velocity and aftertouch. Additionally, there's a keyboard tracking control that, when set close to the 12 o'clock position, ensures the filter frequency tracks at 100 percent over roughly three octaves.

- **FREQUENCY:** VCF cutoff/frequency
- **RESONANCE:** VCF resonance
- **VEL.CTRL:** VELOCITY -> VCF cutoff modulation amount
- **VEL. Q CTRL:** VELOCITY -> VCF resonance modulation amount
- **A/T CTRL:** AFTERTOUCH -> VCF cutoff modulation amount
- **A/T Q CTRL:** AFTERTOUCH -> VCF resonance modulation amount
- **ADSR2 CTRL:** ADSR2 -> VCF cutoff modulation amount
- **KEYB.KTRL:** VCF cutoff keyboard tracking amount

Within the filter section, there is a dedicated contour generator (**ADSR2**) accompanied by a bi-polar amount control. Positioned adjacent to this are three switches that influence the contour.

## ENVELOPE GENERATORS

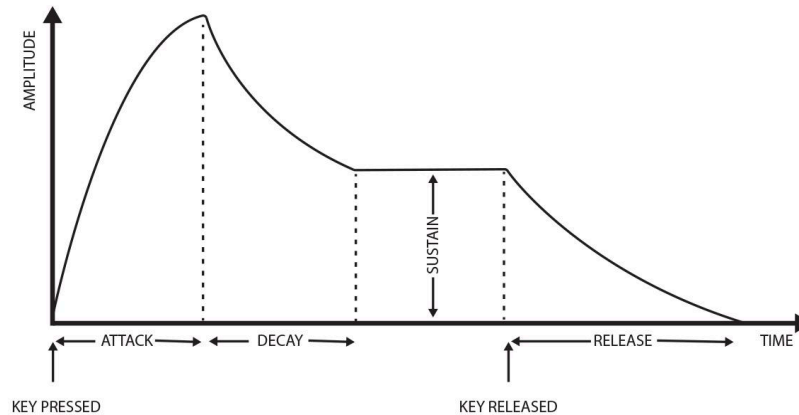


The KIJIMI features two envelope generators (**EG**). The first one is dedicated to controlling the output voltage (**VCA**), while the second is responsible for adjusting the filter cutoff value and parameters in the **MODULATIONS** section. Through the modulation section, these generators can be applied across a **VCO1**, **VCO2**, **WAVE1** and **WAVE2** parameters.

An envelope generator, a classic electronic module, constructs a control signal in four segments: **ADSR** (Attack – Decay – Sustain – Release).

## ADSR1 & ADSR2

- **ATTACK:** Controls how quickly the volume rises
- **DECAY:** Manages the time for the volume to decrease to the sustain level
- **SUSTAIN:** Governs the level sustained while the note is held
- **RELEASE:** Dictates the time for the volume to fade to zero after releasing the note.  
Maximum time is 8 seconds.



## 2/3/4 MULT

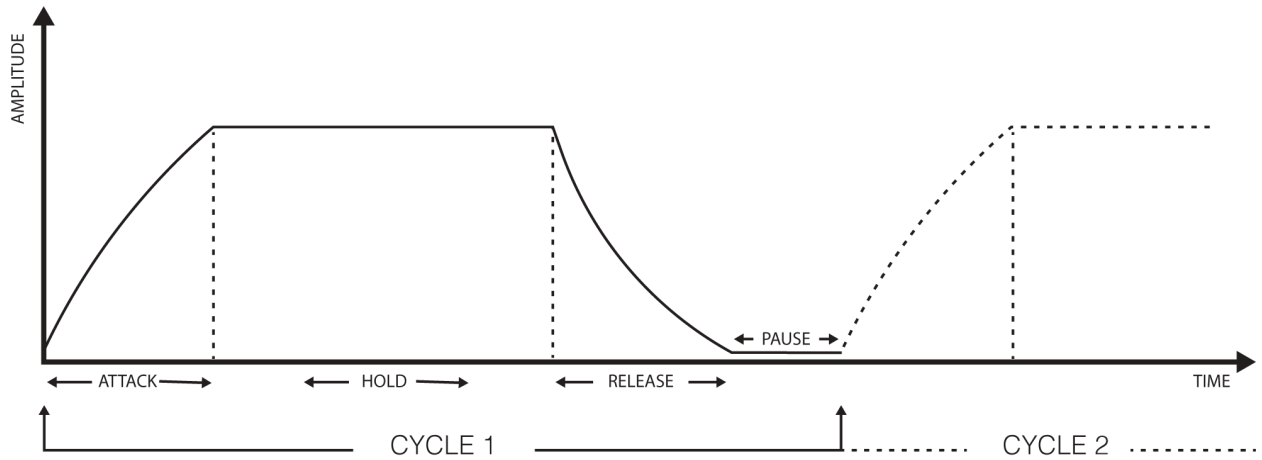
The first switch extends the **ATTACK**, **DECAY**, and **RELEASE** times by factors of 2, 3, or 4.

- **2/3/4 MULT:** ADSR 1&2 global time multiplier:
- **RED:** 2x longer
- **GREEN:** 3x longer
- **BOTH:** 4 times longer

## CYCLE

Enable loop mode for ADSR 1 and 2. This means that while the note is sustained, the Envelope Generator will cycle through the attack to release phases, skipping the sustain stage.

- **RED:** ADSR2 cycle on
- **GREEN:** ADSR1 cycle on
- **BOTH:** ADSR2 and ADSR1 cycle on

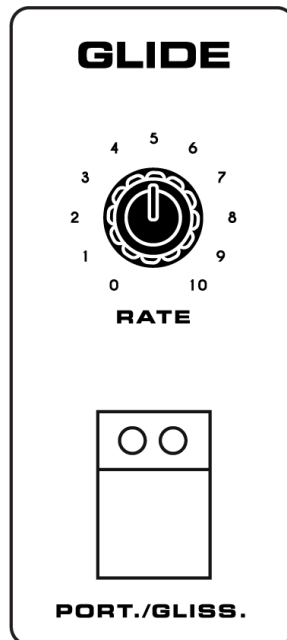


## K.T.

Attack Keyboard Tracking: Slower ADSR Attack on lower range of keyboard, faster ADSR Attack on higher range of keyboard.

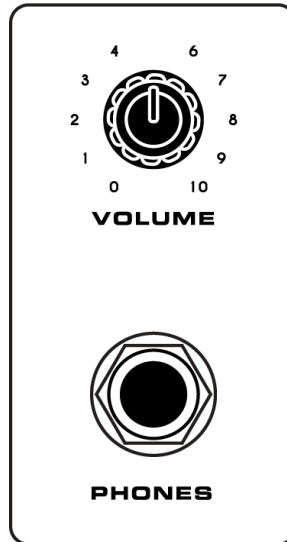
- **RED:** ADSR2 K.T.
- **GREEN:** ADSR1 K.T.
- **BOTH:** ADSR2 and ADSR1 K.T.

## GLIDE



- **RATE:** time for portamento / glissando - 2sec/oct
- **PORT/GLIS**
- **RED:** portamento,
- **GREEN:** glissando

## AUDIO/HEADPHONES OUTPUT

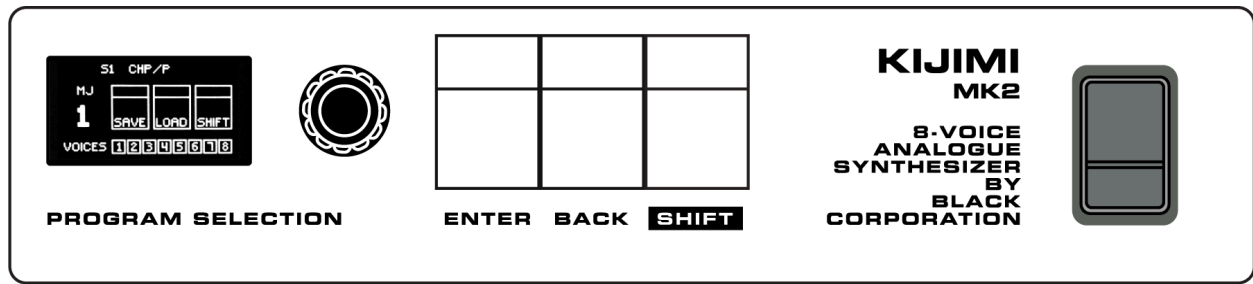


KIJIMI's audio output jack is unbalanced monaural. Turn the **VOLUME** knob to minimum (fully counter-clockwise) before connecting an audio cable. Insert one end of a 1/4 inch instrument cable into the jack labeled **AUDIO OUT** on the back of the unit, and the other end into a powered amplifier or the input of an audio mixer. Now adjust the volume level by turning the **VOLUME** knob clockwise.

The **HEADPHONES** output is a stereo output that duplicates the synthesizer's mono output to both the left and right channels. Like the **AUDIO OUT** jack, the **HEADPHONES** output is controlled by the **VOLUME** knob. Turn the **VOLUME** knob to minimum before inserting a headphone cable, then adjust volume to an appropriate level.



## PROGRAM SELECTOR BUTTONS



There are three buttons in the **PROGRAM SELECTOR** section, as well as an **ENCODER**. On the panel, the buttons are labeled as **ENTER**, **BACK**, and **SHIFT**.

For the purposes of this manual, the **ENTER**, **BACK**, and **SHIFT** buttons will be described both in terms of their panel label as well as the variant name described on the display, as button functions may change depending on the subsection of the selected settings menu.

Button presses will be labeled in the following format: **PHYSICAL BUTTON NAME (DISPLAY BUTTON NAME)** For example, from the patch selector screen, pressing the **SHIFT** button causes the display name of the **BACK** button to be relabelled **STNG**, for settings. This manual will describe this in the format of **BACK (STNG)**.

## BANKS & PRESET SELECTION

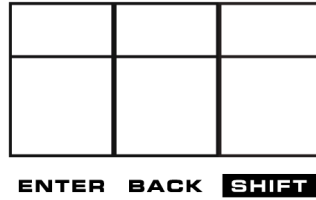
When first exploring KIJIMI, it may be helpful to experiment with the 3 factory preset banks to understand the capabilities of the synthesizer. The remaining 8 banks may be used to store your own presets. KIJIMI's factory patches have been designed to demonstrate the vast range of capabilities and expressivity the synthesizer is capable of.



It may also be interesting to switch between **INDIVIDUAL** and **COMMON LFO** modes in the settings menu for more complex presets.

## SELECTING BANKS

To bring up the bank selection menu, press and hold the **SHIFT** button. You may change banks by rotating the encoder knob. Additionally, when holding the **SHIFT** button, the on-screen labels for the row of multi-function buttons next to KIJIMI's screen will update to the following:



While holding **SHIFT**, press **ENTER (BANK)** to cycle through banks until the desired patch bank is selected.

To begin exploration of KIJIMI by building original patches from the panel settings press the **ENCODER** to enter **PNL** (Panel) Mode.

## SELECTING PATCH PRESETS

When navigating to a new bank, patch preset 1 will be selected. To select the next patch preset, turn the **ENCODER** clockwise. To select the previous patch preset, turn the **ENCODER** counter-clockwise.

Some **MIDI** controllers and DAWs are capable of sending Program Change messages. KIJIMI will respond to Program Change messages, allowing for selection of the next, previous, or specific patch numbers from the current bank, or from a different bank entirely. Be sure to turn **CC RECEIVE** on if you wish KIJIMI to respond to program change and **MIDI CC** control messages.

## SAVING PATCH PRESETS

KIJIMI has 1408 editable patch presets total over the three factory and 8 user banks. Each bank has 128 available editable patch presets.

### Saved patches store the following values:

- All front panel knob and button settings
- All non-GLOBAL settings in the menus

### To enter **SAVE** mode:

- Press **ENTER (SAVE)**. The Active Voices displayed will be replaced by the word **SAVE** to confirm KIJIMI is in Save mode.

### To save/overwrite a patch in the current preset memory location:

- Press **ENTER (SAVE)** a second time. The patch has been saved, overwriting the previous values of that preset.

### To save/overwrite a patch in a new preset memory location and/or bank:

- Be sure to select the Bank by holding **SHIFT** and turning the encoder and after releasing **SHIFT**, turn the encoder to select the preset slot.
- Press **ENTER (SAVE)** again. The patch has been saved, overwriting the previous values of that preset.

## SAVING AND UPLOADING BANKS FROM YOUR COMPUTER

You can upload and save your preset banks in KIJIMI MK2 using the **BC Updater** program, which can be downloaded from the [support section of our website](#). Before performing any preset uploads, make sure to back up all your banks to avoid the risk of losing them.



**NOTE:** You can also use third-party software such as SySex Librarian (Mac) and MIDIOX (Windows).

## EDITING PATCH PRESETS

Once a patch has been saved, it can be edited at any time by recalling it and adjusting the buttons and knobs or patch-specific settings until the desired sound is reached.

Once adjustments have been made to your liking, save the preset to a bank and preset slot as desired.

## BACKING UP PATCH PRESETS

Importing and exporting of KIJIMI preset banks is done via SysEx. Connect KIJIMI to a computer via USB or DIN MIDI and interface, then set the SysEx program (there are many freely available online) up to listen to incoming SysEx. Then hold the Shift button while pressing the Encoder button. This will send a SysEx burst via MIDI containing all of the bank's patch data to the connected computer.

## PANEL MODE

Panel mode bypasses preset settings and responds and behaves based on current positions of all controls on the front panel. While KIJIMI does not have a method to initialize patches to a default state, panel mode may be used to create patches from initial settings, which can be saved to any patch memory location or bank using the instructions above.

To place KIJIMI in panel mode, press the **ENCODER**. The display will read **PNL** in place of the patch number display.

To exit panel mode, press the **ENCODER** again to return to the previous stored patch number or rotate to select another preset.

## SETTINGS

The settings menu allows for control of not only the global settings of the synthesizer, but also a subset of per-patch settings not accessible elsewhere on the front panel.

Each subsection described in this manual of the menu will be labeled **GLOBAL** if its effect spans across all banks and patches, or **PER-PATCH** if it affects only the current patch. For **PER-PATCH** settings, remember to save the patch after adjustments have been made in order to retain the new settings.

To access the settings menu, hold **SHIFT** and press **BACK (STNG)**.

Once in the settings menu, rotate the **ENCODER** to navigate through the settings menu sections. Press **ENTER (RUN)** or **ENTER (EDIT)** to select a section, and **BACK (BACK)** to return to the previous screen.

From within the menu section, pressing **BACK (BACK)** will return to the previous menu.

## RETUNE

**RETUNE** quickly retunes KIJIMI's oscillators. This is especially useful when the units oscillators are operating at a different temperature from when they were calibrated. Selecting this section of the settings menu displays the following message: "TO START RETUNE PRESS ENTER."

Pressing **BACK (BACK)** cancels the retuning process and returns to the main settings page.

Pressing **ENTER** will start the retune process. The display will now read: "RECALIBRATION IN PROCESS." Retuning takes approximately 10-20 seconds. When complete, the screen will display "DONE." Pressing **BACK (CNCL)** will cancel calibration.

When calibration is complete, the display will read "DONE." Press **BACK (OK)** to return to the patch selection screen.



**NOTE:** if this must be done regularly when KIJIMI is at its usual operating temperature, it may be a good idea to run a full calibration of the unit. This procedure is described in greater detail in the **CALIBRATION** section later in this manual.

## MIDI SETTINGS

This section selects how a **MIDI** controller, sequencer, or Digital Audio Station (DAW) interacts with KIJIMI.

**MODE (GLOBAL)** determines how KIJIMI operates with MIDI controllers, based on their capabilities. There are 2 settings: **POLY AFTERTOUCH**, and **MPE**.

Note: Controllers require configuration, please refer to their respective manuals.

- For **MIDI** controllers with standard or no aftertouch, select the **CHANNEL PRESSURE** setting.
- For **MIDI** controllers that are capable of polyphonic aftertouch, select the **POLY AFTERTOUCH** setting.
- For **MIDI Polyphonic Expression (MPE)** controllers such as Roli Seaboard, Roger Linn Linnstrument, or Haken Continuum, select the **MPE** setting.

**CHANNEL (GLOBAL)** selects the **MIDI** channel on which KIJIMI will receive messages. The content of this menu section will change, depending on which controller type is selected in the **MODE** settings subsection.

If **POLY AFTERTOUCH** is selected in the **MODE** setting, any of the **16 MIDI** channels may be selected using the **ENCODER** and pressing **ENTER (SAVE)**. The display will update to the currently selected **MIDI** channel (by default, channel 1).

If **MPE** is selected in the **MODE** setting, only **MIDI** channels 1-8 can be selected. This is because the **MPE** standard uses an individual **MIDI** channel for each voice in order to allow for polyphonic velocity, aftertouch, and other expressivity controls per voice. KIJIMI assigns **MIDI** channels 9-16 to each of its 8 voices. The master **MIDI** channel selected (1-8) assigns the master channel the connected MPE controller will use to communicate with KIJIMI. Rotate the **ENCODER** to select a new channel, then press **ENTER (SAVE)** to save the selection.

**OUT CHANNEL (GLOBAL)** selects the MIDI channel on which KIJIMI will transmit CC messages. This allows KIJIMI to also work as a controller for other **MIDI** devices connected to its **MIDI** out connector or over **USB**. This works for all knobs and buttons excluding **ENTER**, **BACK**, and **SHIFT**

**CC RECEIVE (GLOBAL)** determines whether KIJIMI will accept incoming continuous control (CC) messages from a sequencer or controller.

- **OFF** will ignore all incoming CC messages.
- **ON** will allow KIJIMI to be modulated by external CC messages and program changes from a MIDI sequencer or controller.

## CC74 REPLACE (GLOBAL) CC74 REPLACE (PER-PATCH)

**MPE** controllers allow additional expressivity by playing on the keys vertically, for example, along the surface of the keys. These movements are translated to continuous control messages on channel 74, which cannot be changed on the controller.

For this reason, KIJIMI's firmware allows for assigning the destination for **CC74**, in order to take advantage of the vertical dimension of **MPE** controller series' keys.

Destinations include:

- **LFO1 RATE (CC55)**
- **LFO2 RATE (CC58)**
- **SUB OSC (CC63)**
- **VCF FREQ (CC69)**
- **VCF RESO (CC73)**

**KNOBS (GLOBAL)** sets how KIJIMI responds to physical rotation of the knobs if the position differs from the value stored in the current saved patch. The options are **PICK UP**, **MERGE**, and **INSTANT**.\*

**CC (GLOBAL)** sets how KIJIMI responds to incoming **CC** messages if the position differs from the value stored in the current saved patch. The options are **PICK UP**, **MERGE**, and **INSTANT**.

## PICK UP, MERGE, and INSTANT

**PICK UP:** Rotating knobs will have no effect until the knob position moves through the stored value of the current patch. Once the knob has moved through the stored value, changes will occur based on the actual position of the knob.

**MERGE:** Rotating knobs has an immediate effect, merging the stored value of the current patch and the physical position of the knob as it is turned, eventually merging at the physical position.

**INSTANT:** Rotating knobs has an immediate effect, instantly jumping from the stored value of the patch to the physical knob position.

**MOD WHEEL DESTINATION (PER-PATCH)** selects the destination to where the connected controller's modulation wheel/control will modulate. Destinations include:

- **LFO1 RATE (CC55)**
- **LFO2 RATE (CC58)**
- **LFO1 AMOUNT (CC5)**
- **LFO2 AMOUNT (CC8)**
- **VCF FREQ (CC69)**

**MOD WHEEL POLARITY (PER-PATCH)** selects whether the mod wheel increases or decreases the value of the destination selected in **MOD WHEEL DESTINATION**.

**POSITIVE** adds to the value of the **CC** destination as the action of the mod controller increases, while **NEGATIVE** decreases it.

**PITCHBEND RANGE (PER-PATCH)** sets the maximum pitchbend range of of the connected controller. The default setting is 3 semitones. The allowable range is 1 to 99 semitones.

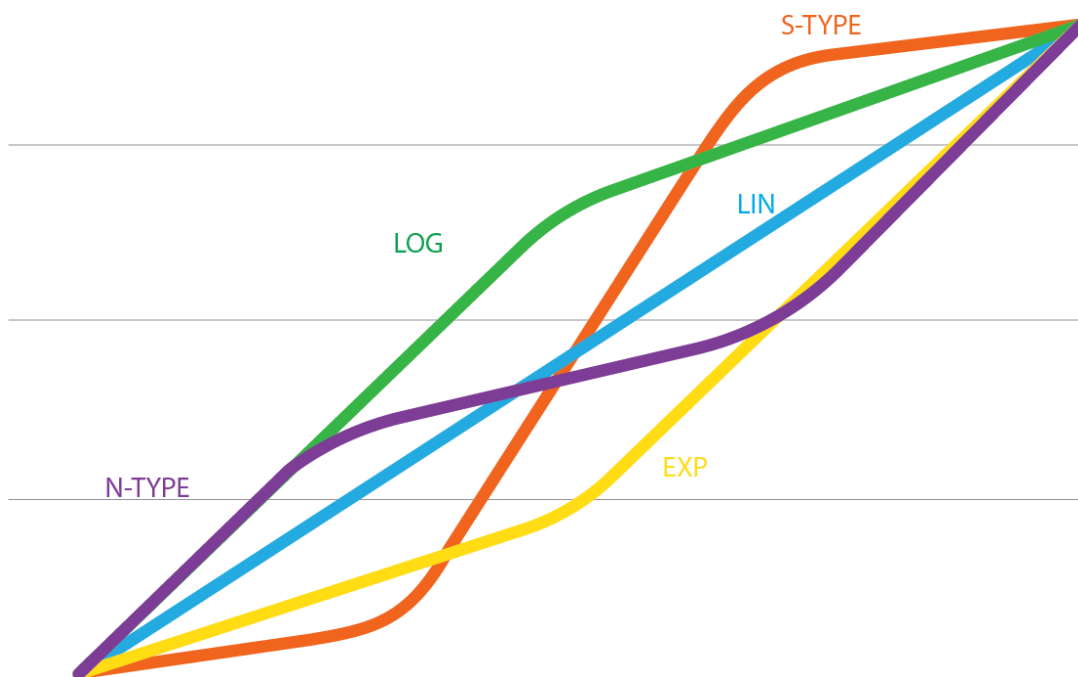
**MPE PITCHBEND RANGE (PER-PATCH)** sets the maximum **MPE** pitchbend range of of the connected controller. The default setting is 48 semitones. The allowable range is 1 to 99 semitones.

## VELOCITY AND AFTERTOUCHE PARAMETERS

**VELOCITY CURVE (PER-PATCH)** determines the shape of the spread of values applied to all velocity modulation parameters. These include **LINEAR**, **LOGARITHMIC**, **EXPONENTIAL**, **STYPE**, **NTYPE**.\*\*

**AFTERTOUCHE CURVE (PER-PATCH)** determines the shape of the spread of values applied to all aftertouch modulation parameters. These include **LINEAR**, **LOGARITHMIC**, **EXPONENTIAL**, **STYPE**, **NTYPE**.\*\*

- **LINEAR:** A linear curve increases or decreases at a fixed rate over time.
- **LOGARITHMIC:** A logarithmic curve increases or decreases more quickly at first, then slows its increase or decrease over time.
- **EXPONENTIAL:** An exponential curve increases or decreases more rapidly over time.
- **STYPE**
- **NTYPE**



\*\***VELOCITY** and **AFTERTOUCHE** shapes can most simply be described with this chart



## VOICE SETTINGS

The **VOICE** settings section governs how KIJIMI assigns and manages its 8 analogue voices and how they are played.

**MODE (PER-PATCH)** selects how voices are assigned as keys are played. Available options are **MONOPHONIC**, **POLYPHONIC**, and **UNISON**.

- **MONOPHONIC:** KIJIMI uses only 1 of its 8 voices at a time. Pressing a new key will override the previous note, with the most recently played note taking priority by default. Select this mode for monophonic behavior.
- **POLYPHONIC:** KIJIMI allows up to all 8 of its analogue voices to be played simultaneously (depending on the **NUMBER OF VOICES** set). Select this mode to play chords or simultaneously overlapping notes.
- **UNISON:** KIJIMI behaves as a monophonic synthesizer, assigning up to 8 voices simultaneously to a single note (depending on the **NUMBER OF VOICES** set). Pressing a new key will override the previous note, with the most recently played note taking priority. Select this mode for monophonic behavior with the thickest sound possible.

**NUMBER OF VOICES (GLOBAL)** determines the maximum number of voices available in **POLYPHONIC** mode. This setting does not affect the **MONOPHONIC** or **UNISON** modes, as they are already limited to 1 voice. Available options are 8 (default) to 1.

**VCA LEVEL (PER-PATCH)** determines the maximum output level of KIJIMI's VCA. The default setting is 10%. The allowable range is 10% to 100%. Higher percentages will have a higher final output volume.

**DETUNE (PER-PATCH)** adds "pitch drift" to KIJIMI's **VCOs**. While KIJIMI is a modern synth with stable tuning, it may be desirable to simulate the randomly detuned nature of classic analogue synths to create thicker sounds. Pitch drift can be introduced in 1/10th of a Hz (or 1/10th of one frequency cycle per second), with a maximum of 3.0 Hz.

Detuning will have varying results depending on the **VOICE MODE** setting:

- In **MONOPHONIC** mode, the current note will be detuned from its center pitch, with the amount of detuning from central pitch determined by the Hz setting.
- In **POLYPHONIC** mode, detuning will introduce random pitch fluctuations per voice. At lower detune settings, detuning will introduce a warble into played chords, while extreme detuning settings will result discordant sounds barely recognizable as the chord being played.
  - In **UNISON** mode, detuning will create an even thicker sound than standard **UNISON** mode, especially useful for bass patches. At lower detune settings, the sound becomes slightly thicker, while extreme detuning settings result in a swarm-like sound.

**PLAYBACK (PER-PATCH)** determines how the sustain of notes or chords is handled when new notes or chords are played. Available options include SUSTAIN I and SUSTAIN II .

- **SUSTAIN I:** All notes sustain and release independently regardless of what other notes or chords are played, and each note has the same release time. This mode is also called “round-robin” voice allocation.
- **SUSTAIN II:** Notes or chords will be cut off by any new notes or chords that are played (unless held down). The last notes or chords played will carry the sustain and release. This setting can have a dramatic effect if portamento or glissando is enabled, and with patches that have long Release times. It is a special, musically useful voice mode that is carried over from Deckard’s Dream.

**CARDS PER VOICE (PER-PATCH)** setting may be used to select the number of voice cards to a single voice. Increasing the number of voice cards per voice results in a thicker sound. Available options are 1, 2, and 4.

This setting affects only the **MONOPHONIC** and **POLYPHONIC** settings in the **VOICE MODE** settings section. Because selecting **UNISON** assigns all 8 voice cards to a single voice, **CARDS PER VOICE** does not affect the **UNISON** setting.

- **ASSIGNS 1 VOICE** card to 1 voice. This allows for up to 8 notes to be played simultaneously in **POLYPHONIC** mode.
- **ASSIGNS 2 VOICE** cards to 1 voice, for a thicker sound per voice. This allows for up to 4 notes to be played simultaneously in **POLYPHONIC** mode.
- **ASSIGNS 4 VOICE** to 1 voice, for an even thicker sound per voice. This allows for up to 2 notes to be played simultaneously in **POLYPHONIC** mode.

## LFO SETTINGS

The **LFO** settings allow you to determine whether you would like to operate KIJIMI in a manner that is simple and straightforward or incredibly complex allowing for interesting variations to add additional character to your sounds.

**LFO1** and **LFO2** have their own menus with the following options:

- **LFO EG DEST (PER-PATCH):** Determines whether Attack and Decay of the **LFO EG** affects **AMPLITUDE**, **RATE**, or **BOTH**.

**RATE** or **BOTH** can not be selected when **LFO SYNC** is set to **MIDI**.

- **EG MAX (PER-PATCH):** Adjusts the time for the **LFO** envelope from 1-20 seconds.
- **EG AMOUNT (PER-PATCH):** Adjusts the amount the **EG** affects the behavior of the **LFO**.

**LFO MAX (PER-PATCH)** allows for control of the maximum frequency of **LFO1** and **LFO2**. This determines the frequency value when the **RATE** knob is set to max.

Rotate the **ENCODER** to select the desired frequency, then press **ENTER (SAVE)** to save the selection.

Press **CANCEL (CNCL)** at any time to cancel any changes to the **LFO MAX** settings and return to the **TIME** settings menu.

**LFO MIN (PER-PATCH)** allows for control of the minimum frequency of **LFO1** and **LFO2**. This determines the frequency value when the **RATE** knob is set to minimum.

**LFO SUSTAIN MODE (PER-PATCH)** determines whether each **LFO EG** sustains when notes are held down, or whether it goes directly from the **ATTACK** phase to the **DECAY** phase.

**LFO SYNC (PER-PATCH):** Determines whether the **LFO** runs freely, syncs to a **MIDI** clock signal, or to the other **LFO**.



**NOTE: MIDI** can not be selected when **LFO EG DEST** is set to **RATE** or **BOTH**.

## MOD MODE (GLOBAL)

MOD MODE selects if you wish to operate the **LFOs** in the classic mode as you see on the panel (**COMMON**) or if you wish to have independent control over amounts of modulation to each individual modulation destination (Individual). Individual mode allows for more complex modulations.

## LFO MODE (PER-PATCH)

LFO MODE determines the behavior of the **LFO** when multiple notes or chords are played. Available options include **POLY** and **MONO**.

- **POLY: LFO** cycles are created independently per note. If multiple notes are played at different times, their **LFOs** will cycle independently. This setting will have no effect if KIJIMI is in MONOPHONIC or **UNISON** voice mode.
- **MONO: LFO** cycles are synced across all notes. The cycle phase is determined by the first note pressed in the chord.

## ENVELOPE (PER-PATCH)

Similar to **LFO** settings, these settings let you set parameters of the **ENVELOPES (ADSR1 and ADSR2)**.

## CYCLE MODE (PER-PATCH)

**CYCLE MODE** sets when an **ADSR** has been set to **CYCLE** mode using the **CYCLE** button, to **POLY** (individual per voice) or **MONO** (the cycling **ADSR** is global to all voices).

**KT MULT** selects when an **ADSR** has been set to **K.T.** (keyboard tracking of Attack time), the multiple of the effect of that tracking. When set to X4 (multiplied times 4), the **ADSR** Attack will be 4 times slower towards lower end of the keyboard, than it would be with X1.

## ADSR2 MODE

**ADSR2 MODE** selects if you wish to operate **ADSR2** in the classic mode as you see on the panel (**COMMON**) or if you wish to have independent control over amounts of modulation to each individual modulation destination (**INDIVIDUAL**).

## ARPEGGIATOR

The Arpeggiator allows for notes to be played and re-triggered according to a clock source. When Arpeggiator is on, a single key press will repeat the note at the set clock rate, while pressing a chord will play the notes in a sequence according to the settings in this menu.

**STATE (GLOBAL)** sets whether the arpeggiator is **OFF** or **ON**.

**STYLE (GLOBAL)** sets the playing style of the arpeggiator and behaves as follows:

- **UP** - lowest to highest
- **DOWN** - highest to lowest
- **UP DOWN** - lowest to highest (played once) and back
- **UP AND DOWN** - lowest to highest, then highest to lowest
- **PINKY UP** - similar to UP with highest note played between other notes
- **PINKY UP DOWN** - similar to UP DOWN with highest note played between other notes
- **THUMB UP** - similar to UP with lowest note played between other notes
- **THUMB UP DOWN** - similar to UP DOWN with lowest note played between other notes
- **PLAY ORDER** - notes play in the order they are engaged
- **CHORD** - repeats chords
- **RANDOM** - Notes play randomly
- **RANDOM ONCE** - Notes play randomly without repeating until all notes have been played

### **ARPEGGIATOR: RATE (GLOBAL)**

sets time-based parameters of the Arpeggiator.

- **VALUE** - sets the BPM
- **RANGE** - clock division 16/1..1/256
- **SYNC** - internal or MIDI

### **ARPEGGIATOR: RANDOMIZER (GLOBAL)**

- **STATE** - ON/OFF
- **SCALE** - 1..24
- **SCALE RAND** - 0..12
- **CHANCE** - 0..100%
- **SIGN** - ADD, SUB, BI

### **VELOCITY (GLOBAL)**

- **MODE** - ON/OFF
- **TARGET** - 1..64

### **PRESET VOLUME (PER-PATCH)**

adjusts the gain of an individual patch, allowing for normalizing volume between patches if desired. The available range of gain includes -6db to +6db.

## MICROTUNING SETTINGS

**MICROTUNING** allows KIJIMI to be played in keys outside of standard 12 tone equal temperament. Available options include ON or OFF.

### STATE

- **ON:** Microtuning is enabled. This also enables a new section of the CALIBRATION settings menu called **TUNING PROGRAM**. KIJIMI has **128 memory locations for storing** individualized micro-tuning programs. These may be custom created, however there are various sources with downloadable files in the **SCALA** or **.scl** format. These files can be uploaded to KIJIMI using any **sysex** librarian software, which is also used to save presets on a computer. When uploaded, KIJIMI will automatically navigate to one of its memory locations where the tuning program may be saved.
- **OFF:** Microtuning is disabled. Tuning is 12 tone equal temperament also known as Chromatic.
- **TUNING PROGRAM:** Selects saved microtuning scales **1-128**.
- **SAVE SCALE:** Sets KIJIMI to receive incoming **.scl** file from a **sysex** library source.
- **DELETE ALL PROGRAMS:** Clears all stored tuning data.

## CALIBRATION SETTINGS

The **CALIBRATION** section sets knob positions, tunes oscillators and filters and individually tune self-oscillation of KIJIMI.

**POTENTIOMETERS** calibrates the physical position of the knobs in relation to the values which they are controlling. Selecting **POTENTIOMETERS** results in the following message, "SET CENTER DETENT KNOBS TO MIDDLE AND PRESS ENTER."

This includes the following knobs:

- All 12 knobs under **VELOCITY** and **AFTERTOUCHE** in the **MODULATIONS** section
- Both (2) **VCO1** and **VCO2 FREQUENCY** knobs
- **OSC2/VCO2 DETUNE** knob in the **VCO2** section
- **All 6 CTRL** knobs under the **VCF** section

After all center detent knobs are centered and ENTER is pressed the display will now read: "SET ALL KNOBS TO MAXIMUM AND PRESS ENTER." Turn **ALL** knobs, including the center

detent knobs to the **MAXIMUM** position (furthest clockwise) and again press **ENTER**. Calibration occurs instantly. When complete, the screen will display "DONE." Press **CANCEL (OK)** to return to the **CALIBRATION** settings screen.

**OSCILLATORS** calibrates the oscillators of all voices simultaneously or on a per-voice basis.



**NOTE:** For best results, allow the unit to warm up for 20 minutes before performing this procedure.

To tune all voices simultaneously, select **TUNE ALL VOICES**. The display will update to read "TO START AUTOTUNE PRESS ENTER."

Pressing **ENTER** will start the oscillator calibration process. The display will now read: "OSC 1A TUNING," and will display a progress bar. Calibration takes approximately 1-3 minutes per voice and proceeds from **OSC 1A** to **OSC 1B** to **OSC 2A** and so on. Full calibration of all oscillators takes approximately 10-15 minutes. When complete, the screen will display "DONE." Press **CANCEL (OK)** to return to the **CALIBRATION** settings screen.

To tune an individual voice, select the specific voice number to be tuned and press **ENTER**.

**FILTERS** calibrates the filters of all voices simultaneously or on a per-voice basis. Similarly to the oscillators, perform this when the unit has had time to warm up.

**FILTER ADJUST** allows the **VCF** frequency to be adjusted for each voice.

## ABOUT

**ABOUT** displays the following information about the device:

- Hardware revision number
- Firmware revision number
- Black Corporation copyright information

## RESET SETTINGS (GLOBAL)

**RESET SETTINGS** reverts all KIJIMI settings back to their defaults. Selecting this will display the following message: “TO RESET SETTINGS PRESS ENTER.”

Pressing **CANCEL (BACK)** cancels the reset process and returns to the main settings page.

Pressing **ENTER** will start the reset process. The display will now read: “CONFIRM RESET” Press **ENTER (OK)** again to confirm, or press **CANCEL (BACK)** to cancel the reset process.

If **ENTER (OK)** is pressed a second time, the reset process takes place immediately and returns all settings to their default values. The display will be automatically returned to the patch selection screen.

**RESET FACTORY BANKS** restores factory banks **SSKM, BC, PS**, etc. but does not overwrite user banks.



## MIDI CC CHART

MIDI CC	FUNCTION
CC0	BANK SELECT
CC1	MOD WHEEL
CC5	POT MOD LFO1 AMOUNT
CC8	POT MOD LFO2 AMOUNT
CC9	EXPANDER SUSTAIN SWITCH
CC10	EXPANDER SUSTAIN SLIDER
CC14	MOD LFO2 TO LPF
CC15	MOD ADSR2 TO VCO2
CC16	POT MOD VELOCITY TO PITCHBEND
CC17	POT MOD AFTERTOUCH TO PITCHBEND
CC18	POT MOD AFTERTOUCH TO VCA
CC31	RANDOMIZE SETTINGS
CC32	PORTAMENTO/ GLISSANDO
CC33	ADSR KT
CC34	ADSR CYCLE
CC35	ADSR MULT
CC36	OSC KEY OFF
CC37	OSC SYNC
CC38	NOISE 1/3
CC39	NOISE 2/3

<b>CC40</b>	POT MOD ADSR2 AMOUNT
<b>CC41</b>	POT MOD VELOCITY TO LFO1 RATE
<b>CC42</b>	POT MOD AFTERTOUC TO LFO1 RATE
<b>CC43</b>	POT MOD VELOCITY TO LFO2 RATE
<b>CC44</b>	POT MOD AFTERTOUC TO LFO2 RATE
<b>CC45</b>	POT MOD VELOCITY TO WAVEFORM MORPH
<b>CC46</b>	POT MOD AFTERTOUC TO WAVEFORM MORPH
<b>CC47</b>	POT MOD VELOCITY TO SUB AMOUNT
<b>CC48</b>	POT MOD AFTERTOUC TO SUB AMOUNT
<b>CC49</b>	POT MOD VCO2 TO VCO1
<b>CC52</b>	POT MOD VCO2 TO VCF
<b>CC53</b>	POT MOD VELOCITY TO VCA
<b>CC55</b>	POT LFO1 RATE
<b>CC56</b>	POT LFO1 ATTACK
<b>CC57</b>	POT LFO1 DECAY
<b>CC58</b>	POT LFO2 RATE
<b>CC59</b>	POT LFO2 ATTACK
<b>CC60</b>	POT LFO2 DECAY
<b>CC61</b>	POT VCO1 FREQUENCY
<b>CC62</b>	POT VCO1 WAVEFORM
<b>CC63</b>	POT SUBOSC
<b>CC64</b>	SUSTAIN PEDAL
<b>CC65</b>	POT VCO2 FREQUENCY

<b>CC66</b>	POT VCO2 WAVEFORM
<b>CC67</b>	POT VCO2 VOLUME
<b>CC68</b>	POT VCO2 OSC2 DETUNE
<b>CC69</b>	POT VCF FREQUENCY
<b>CC70</b>	POT VCF VELOCITY CONTROL
<b>CC71</b>	POT VCF AFTERTOUCHE CONTROL
<b>CC72</b>	POT VCF ADSR2 CONTROL
<b>CC73</b>	POT VCF RESONANCE
<b>CC74</b>	BRIGHTNESS (MPE)
<b>CC75</b>	POT VCF VELOCITY Q CONTROL
<b>CC76</b>	POT VCF AFTERTOUCHE Q CONTROL
<b>CC77</b>	POT VCF KEYBOARD CONTROL
<b>CC78</b>	POT ADSR2 ATTACK
<b>CC79</b>	POT ADSR2 DECAY
<b>CC80</b>	POT ADSR2 SUSTAIN
<b>CC81</b>	POT ADSR2 RELEASE
<b>CC82</b>	POT ADSR1 ATTACK
<b>CC83</b>	POT ADSR1 DECAY
<b>CC84</b>	POT ADSR1 SUSTAIN
<b>CC85</b>	POT ADSR1 RELEASE
<b>CC86</b>	POT GLIDE RATE
<b>CC87</b>	POT VOLUME
<b>CC88</b>	MOD LFO1 TO VCO1

<b>CC89</b>	MOD LFO1 TO VCO2
<b>CC90</b>	MOD LFO1 TO WAVE1
<b>CC91</b>	MOD LFO1 TO WAVE2
<b>CC92</b>	MOD LFO1 TO SUB
<b>CC93</b>	MOD LFO1 TO LPF
<b>CC94</b>	MOD LFO1 TO RESO
<b>CC95</b>	MOD LFO1 TO VCA
<b>CC102</b>	MOD LFO2 TO VCO1
<b>CC103</b>	MOD LFO2 TO VCO2
<b>CC104</b>	MOD LFO2 TO WAVE1
<b>CC105</b>	MOD LFO2 TO WAVE2
<b>CC106</b>	MOD LFO2 TO SUB
<b>CC108</b>	MOD LFO2 TO RESO
<b>CC109</b>	MOD LFO2 TO VCA
<b>CC110</b>	MOD ADSR2 TO VCO1
<b>CC112</b>	MOD ADSR2 TO WAVE1
<b>CC113</b>	MOD ADSR2 TO WAVE2
<b>CC114</b>	MOD LFO2 TO LPF
<b>CC115</b>	MOD ADSR2 TO VCO2
<b>CC116</b>	LFO2 SHAPE
<b>CC117</b>	OSC1 VOL 1/3
<b>CC118</b>	OSC1 VOL 2/3

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