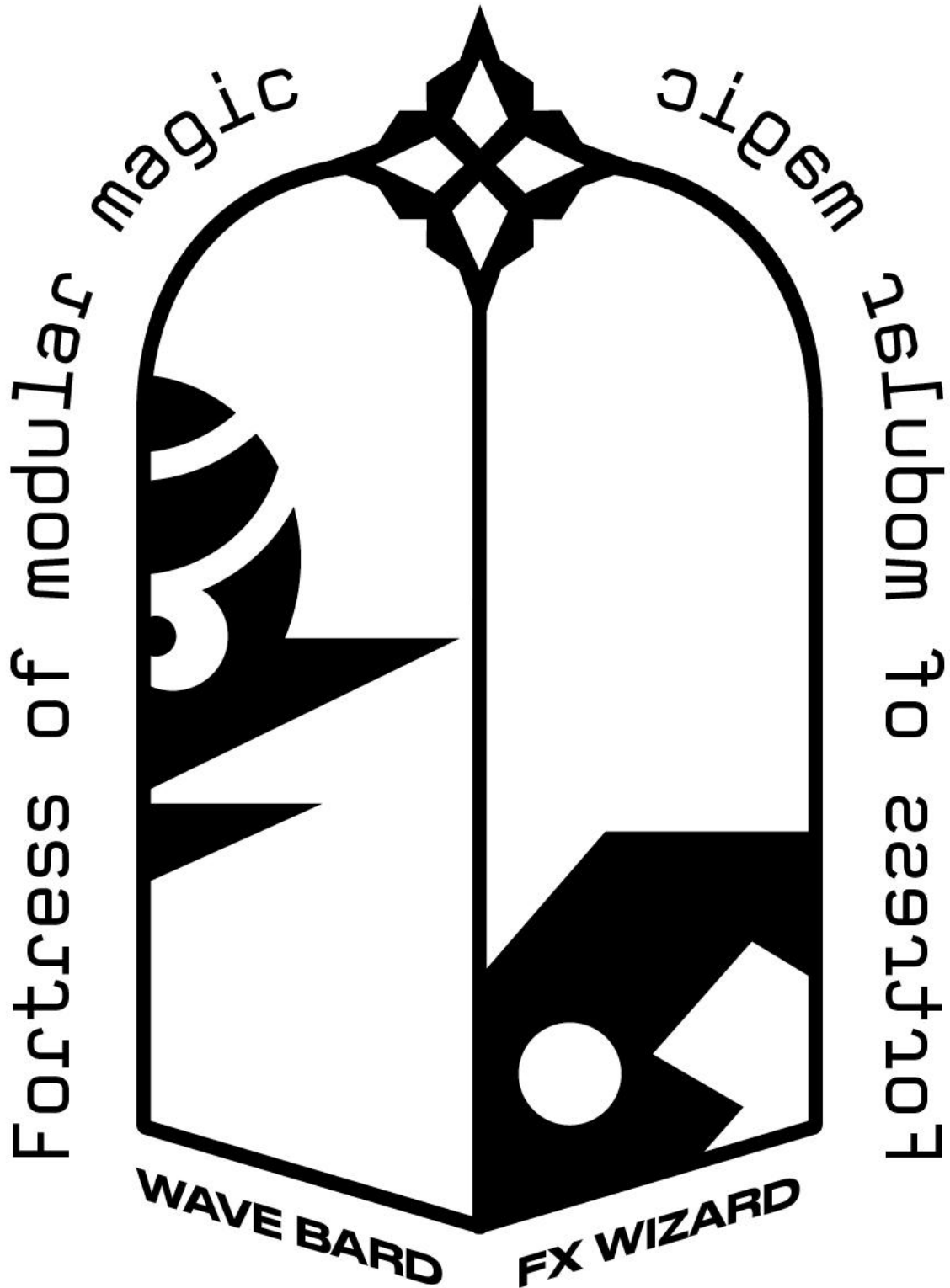


B CITADEL

WAVE BARD

USER MANUAL



CITADEL WAVE BARD

The Citadel Wave Bard is an experimental, stereo sample player eurorack module that empowers you to discover new rhythms and riffs through modulation and modularity.

- Samples are organized in banks, which can be selected and sequenced using knobs or CVs from the built-in pattern generator and LFO.
- Reverse your sounds with the LENGTH knob and the Wave Bard's unique reversing envelope.
- Play melodic samples in quantized scales, and spice up the sound with built-in filter, delay or chorus/flanger effects.
- You can load not only your own samples, but also rhythms and scales with the [web-based app/editor](#).
- Wave Bard receives TRS MIDI and both sends and receives USB MIDI via connector on the back of the module.

The Citadel Wave Bard is a eurorack module version of the compact Kastle 2, portable instrument. This makes it fit perfectly in the modular synth environment while providing all the necessities for a beginner eurorack setup such as headphone output (line level compatible) and MIDI input/sync, while being complex and fun within larger setups.

All main parameters can be modulated and tightly sequenced by the surprisingly powerful CV and GATE pattern generator. Create groovy off-grid beats using the built-in LFO, which can be synced, reset, or left to run freely.

Do not make beats—let them naturally emerge!

The Wave Bard is a semi-autonomous companion that keeps surprising you with fresh ideas. Get instant inspiration from the carefully crafted factory sound bank by Oliver Torr, or load your own samples and remix on the fly.

Wave Bard is not just a sound box—it's a powerful MIDI controller and sequencer when connected via the USB port on the back of the module. Send finely curated USB MIDI data to your DAW or USB MIDI device, and discover new ways of playing and interacting through a modular interface.

Wave Bard receives TRS MIDI via front panel and both sends and receives USB MIDI via the connector on the back of the module.

Features

- 8 samples per bank (adjustable from 3 to 32 samples in the editor)
- 6 factory-loaded banks (up to 32 banks in the editor)
- user samples can be loaded via [via web app](#)
- 89s sample limit (mono), 44s (stereo) at 44kHz, or combination
- even more sample time available at lower sample rates
- stereo audio processing at 44kHz/16-bits

- PITCH knob with range of ± 2 octaves (4 octaves total)
- PITCH MOD attenuverter knob for modulating pitch
 - NOTE input: quantized pitch with selectable scales (updates on trigger)
 - FREE input: continuous, unquantized pitch modulation
 - user-defined scales ([via web app](#))
 - BANK+PITCH MOD to change quantizer scale
 - BANK+SAMPLE MOD for root note adjustment
 - BANK+LFO MOD for fine tuning
 - BANK+PITCH to change and preview octave

- SAMPLE knob to select 1 of 8 samples
 - hit the SHIFT button to trigger the selected sample
 - TRIGGER input to trigger sample playback
 - SAMPLE MOD input with attenuation and two modes:
 - PLAY: CV modulation directly trigger samples
 - CUE: CV aims at samples and playback waits for TRIGGER

- BANK input with attenuation to change sample banks with CV

- LENGTH envelope knob
 - turn right to set decay
 - turn left to reverse samples and add attack
 - during attack, samples don't retrigger
 - LENGTH MOD input with attenuverter
 - LENGTH MOD updates only at trigger
 - patchable ENV output of the envelope

- stereo delay or chorus/flanger FX
- resonant FILTER with Lowpass/Highpass modes

- LFO with triangle and pulse output, reset input, attenuverting modulation, synced or free
- Tempo generator with tap tempo, divider, and external clock input
- Pattern generator (tempo synced) with GATE and CV output, patch-programmable
- GATE generator contains user-programmable RHYTHM patterns ([via web app](#))

- stereo eurorack-level DC coupled input with input gain (up to +6db), accepts up to -10V to + 10V
- input can be mixed at the output or run thru the built in effects
- DC coupled stereo eurorack-level output, -5V to +5V
- stereo headphone output capable of driving headphones up to 250 Ohm
- analog sync input
- analog sync output

- TRS MIDI Input (clock, notes, CCs, pitch bend)
- USB-C on the back of the module (firmware updates, USB MIDI in/out, uploading samples)

TECHNICAL DETAILS

- 16 HP
- PTC fuse and diode protected 10 pin power connector
- 24 mm deep
- current consumption: +12 V: <60 mA (w/o headphones), <90 mA (w/headphones to max); -12 V: <20 mA
- Input Ranges:
 - FREE IN and NOTE IN: **-0.2V to 7V**
 - CLK IN, RESET IN, C IN, G IN: **0V to 5V**
 - LFO MOD, BANK IN, SAMPLE IN, LENGTH IN, LFO RESET, TRIG IN: **-5V to +5V**
 - L/R IN: **-10V to +10V**
- Output Ranges:
 - CLK OUT, ENV OUT, CV OUT, LFO TRI OUT, LFO PULSE OUT: **0V to +5V**
 - L/R OUT **-5V to +5V**
 - Headphone output: 2Vpp (line level compatible)

Introduction

For starters, let me tell you: **Follow the white woodpeckers!**

The knobs with the white woodpeckers control the main parameters for your sound: PITCH, SAMPLE and LENGTH. All other knobs come alive once you start patching.

Hit the SHIFT button to preview your sound.

The Citadel WAVE BARD can be experienced in various ways. It is absolutely legit to just explore and let your ears guide you. If that's your game, you might appreciate the Quick Start guide.

The Quick Start guide is linked [here](#).

MANUAL

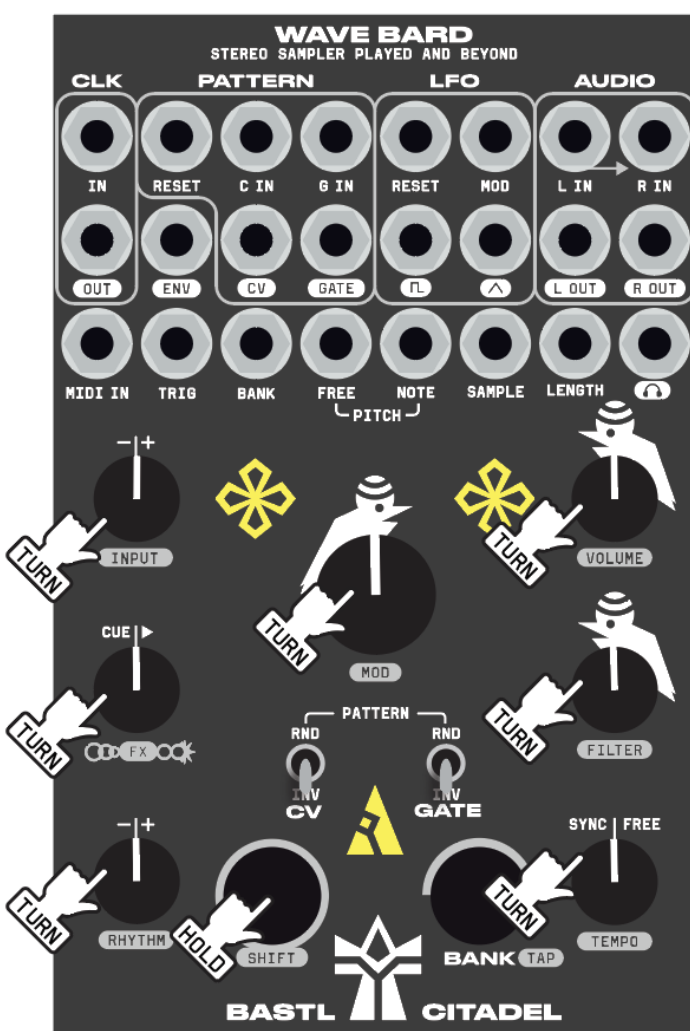
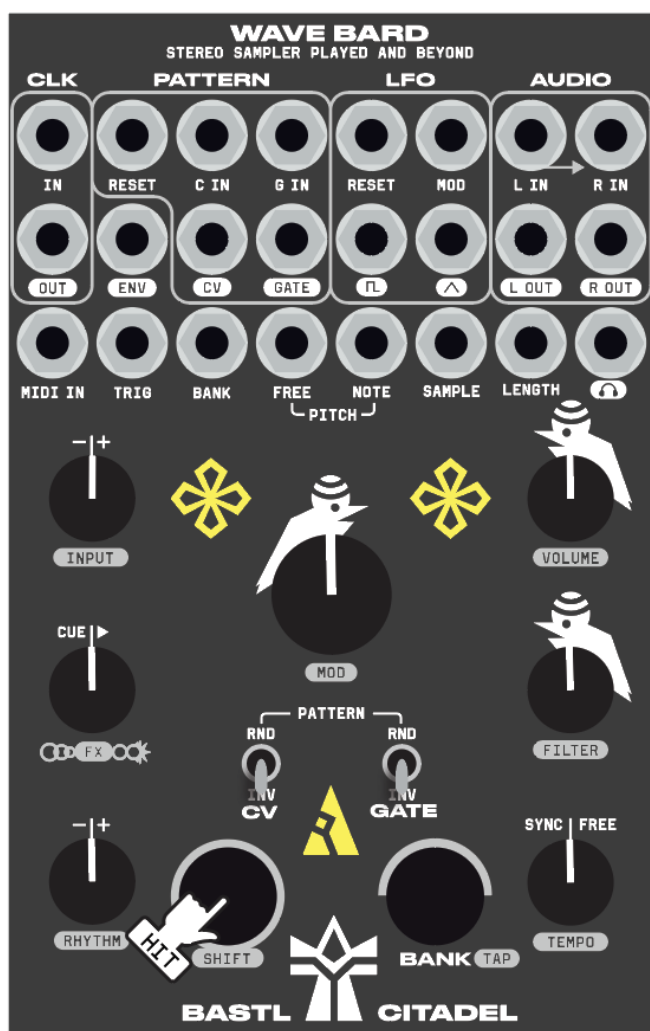
This full manual will give you a better understanding of the Wave Bard's inner workings and help you achieve the results you desire. It provides plenty of tips and shows you just how deep the woodpecker's hollow goes—get ready for an adventure!

Shift

Hit or tap the SHIFT button to **trigger the selected sample**.

NOTE: The trigger signal happens at the button release.

Hold the SHIFT button to access the **silver-labeled functions**. For example, hold SHIFT and turn the PITCH knob to adjust the VOLUME.



Button Combos

Short SHIFT press = trigger sample (on button release)

SHIFT + KNOB = secondary function in silver

SHIFT + BANK = Tap tempo

BANK = next Bank

BANK + SHIFT = previous Bank

SHIFT + BANK >2s = enter/leave ADVANCED SETTINGS (input behavior etc.)

SHIFT + BANK >10s = MEMORY RESET

Connecting Citadel

SHIFT + PITCH MOD knob = set input gain

SHIFT + PITCH knob = set output volume

SHIFT + Knob Combos

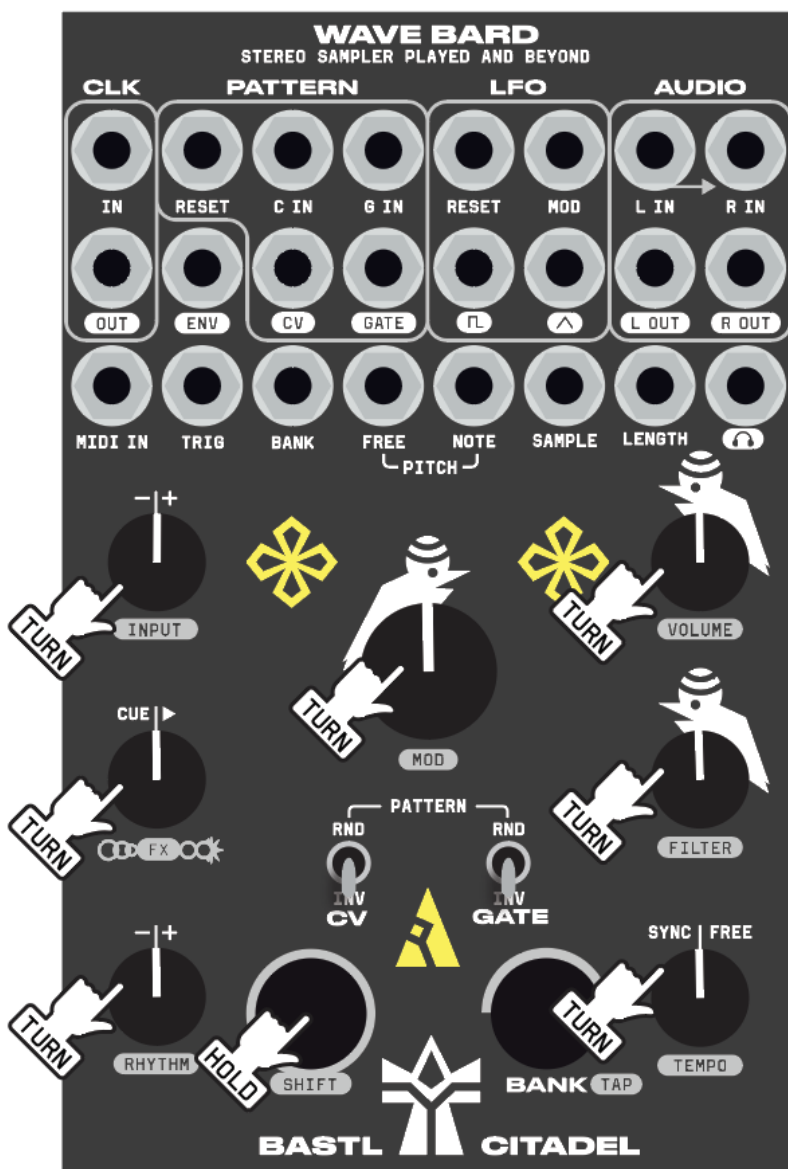
SHIFT + SAMPLE MOD = adjust delay or drive

SHIFT + SAMPLE = adjust low-pass or high-pass filter

SHIFT + LFO = adjust tempo

SHIFT + LFO MOD = load preset rhythm on the GATE pattern generator

SHIFT + LENGTH = attenuation of the LENGTH input



BANK + Knob Combos

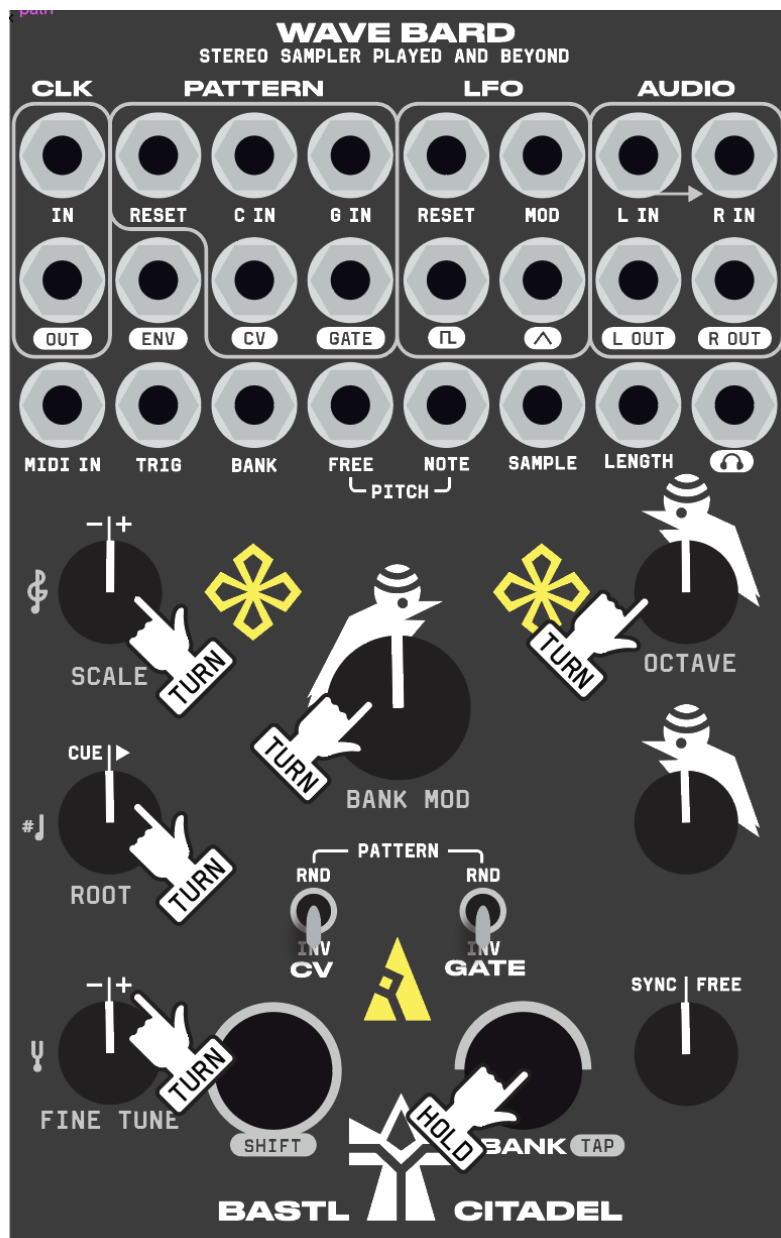
BANK + PITCH MOD = change quantizer scale

BANK + SAMPLE MOD = adjust root note

BANK + LFO MOD = fine tune pitch after quantizer

BANK + LENGTH = modulation attenuation for BANK input

BANK + PITCH = change octave – note change will trigger sample



POWER

Before connecting the ribbon cable to this module, disconnect your system from power! Double-check the polarity of the ribbon cable and that it is not misaligned in any direction.

The red wire should match the -12V rail both on the module and the bus board.

! please make sure of the following:

- you have a standard pinout eurorack bus board
- you have +12V and -12V rails on your bus board
- the power rails are not overloaded by current

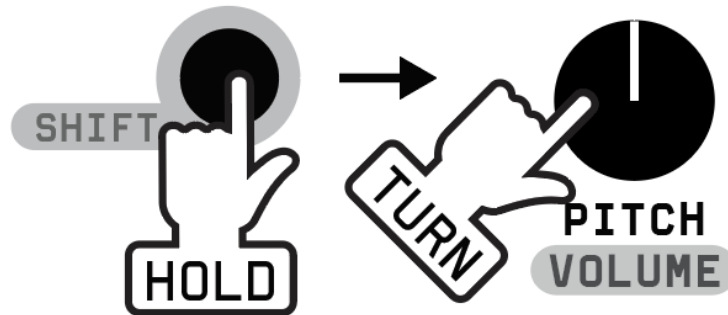
Although there are protection circuits on this device, we do not accept any responsibility for damages caused by the wrong power supply connection. After you've connected everything, double-checked it, and closed your system (so no power lines can be touched by hand), turn on your system and test the module.

AUDIO OUT

Connect the **HP** jack of the Citadel Wave Bard either to headphones or further devices that receive line level audio. Use the L and R OUT for patching inside of eurorack.

👉 🖱️ To set the output **VOLUME**, hold **SHIFT** and turn the **PITCH** knob. The volume affects both the L/R OUT and the Headphones output.

SET VOLUME



AUDIO IN

Connect your eurorack level sound source to the **L IN** and **R IN** jacks. L IN is normalized to R IN so if your source is mono you can plug it to L IN and it will get copied to R IN.

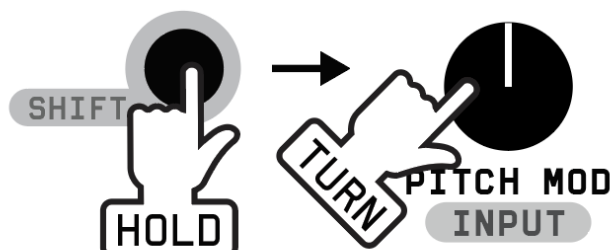
The signal at Audio input will get mixed with the sounds coming from the WAVE BARD at the output.

You can easily dial in the output volume up if it gets too quiet.

You can also route the input to go through the effects of the WAVE BARD – delay, chorus/flanger, and filter. See the [Advanced settings](#) section for the [Input Routing](#) setting.

👉 🖱️ To set the **INPUT** gain hold **SHIFT** and turn the **PITCH MOD** knob. **Input gain** is the amount of amplification of your input signal.

SET INPUT LEVEL



INPUT LEVEL INDICATION



While holding the SHIFT button, the signal strength is indicated by the left light and when it reaches RED, it is clipping at the input, and you should lower your input gain (unless you want to go for that distortion 🤘). Keep the input gain so the signal is peaking into orange.

SAMPLE ORGANIZATION

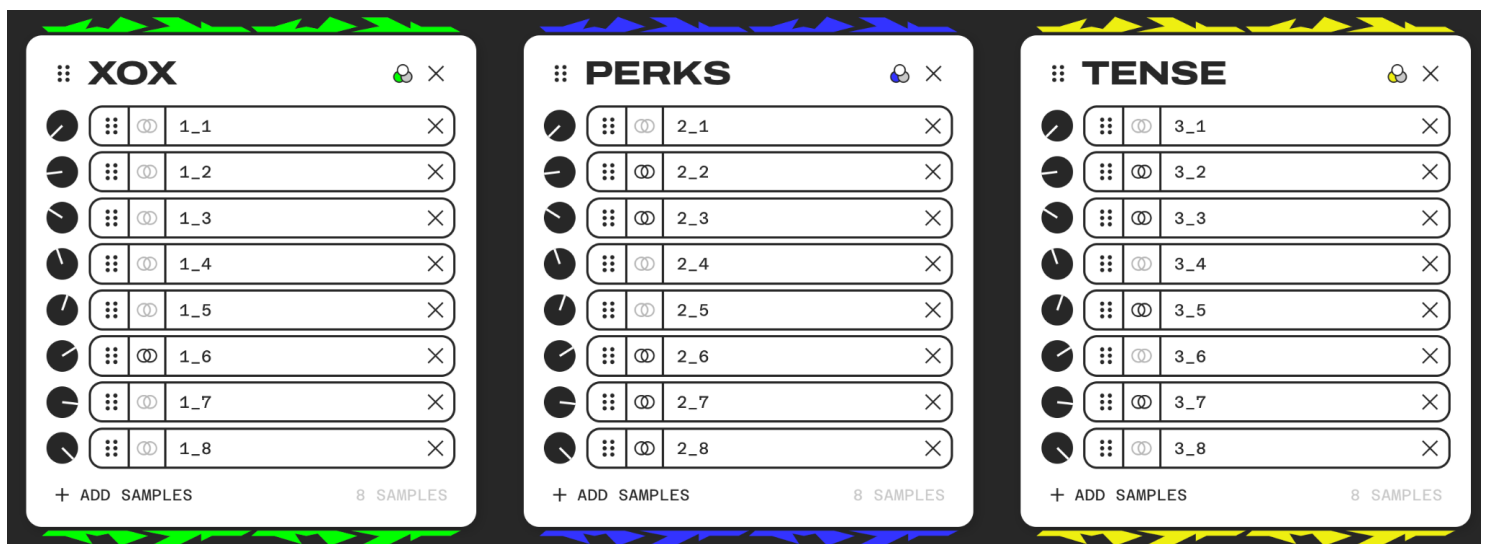
Turn the SAMPLE knob to browse 8 samples. Hit/tap the SHIFT button to trigger the current sample.

By default, there are 6 banks of 8 samples. Each bank has a color attached. Short-press the BANK button to cycle through the banks.

Hold BANK and press SHIFT to go to the previous sample bank.

You can load and organize your own samples via the [web app](#).

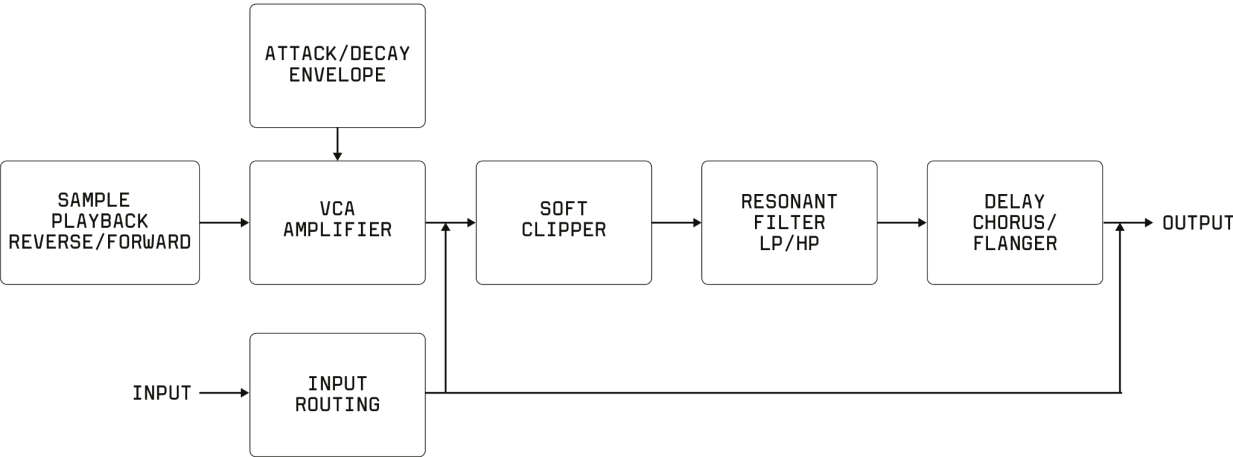
This is an example of how samples are organized in banks:



SIGNAL FLOW

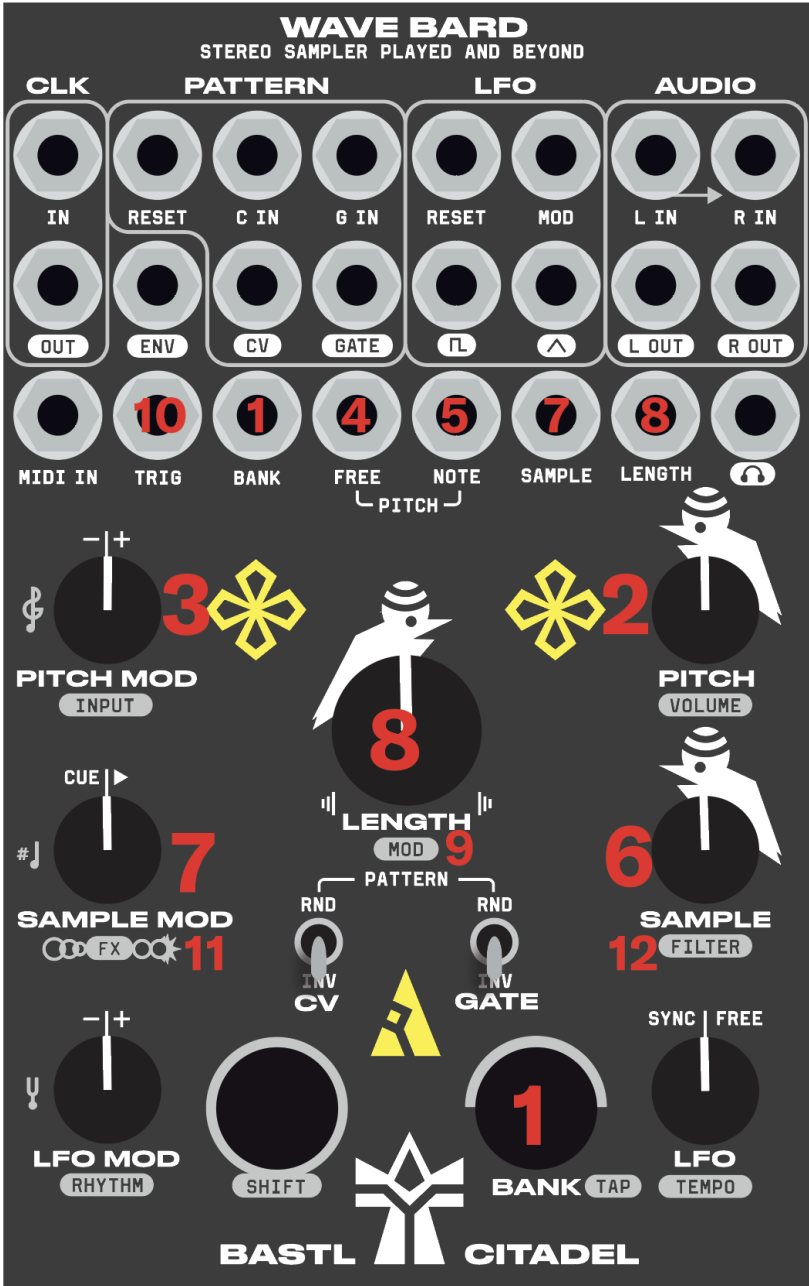
Here is the block diagram of the signal flow of Citadel WAVE BARD.

2x for LEFT & RIGHT



MAIN SOUND CONTROLS

These are the main controls that affect the sound:



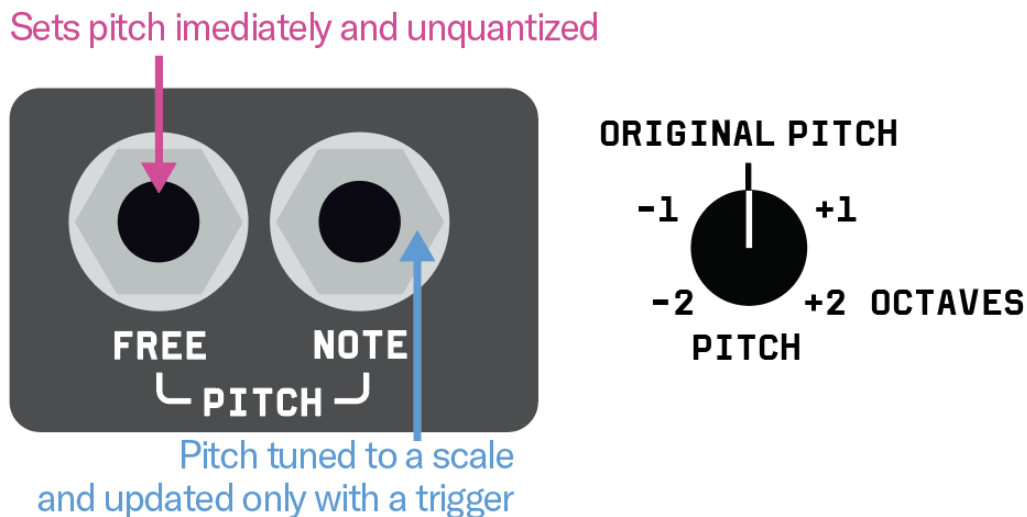
1. BANK

The BANK button changes the bank of 8 samples selectable by the SAMPLE knob. Each bank has assigned a different color.

- Press the BANK button to go to the next Bank.
- Hold BANK and press SHIFT to go to the previous Bank.
- Hold BANK and turn the LENGTH knob to attenuate the CV at the BANK CV input.

2. PITCH

The PITCH knob adjusts the playback rate of the samples. It offers a range of ± 2 octaves (covering 4 octaves in total) and operates without quantization.



👉 🖱️ Hold the BANK button and turn the PITCH knob to change octaves. Each time the octave is adjusted, the sample is also triggered. For more details, refer to the [Quantizer](#) section.

3. PITCH MOD

The PITCH MOD knob controls the amount of modulation applied to the PITCH parameter from the PITCH MOD patch points (indicated by the white arrow pointing toward the knob). When the knob is centered, no modulation is applied. Turning the knob to the right applies positive modulation (fully right is V/Oct scaling), while turning it to the left applies negative modulation.

👉 🖱️ Hold the BANK button and turn the PITCH MOD knob to select a quantizer scale. For further details, refer to the [Quantizer](#) section.

4. FREE (0V to 7V)

The FREE PITCH MOD patch point provides continuous, real-time modulation of the pitch parameter. This input tracks V/Oct standard when the PITCH MOD knob is fully clock-wise.

5. NOTE (0V to 7V)

The NOTE PITCH MOD patch point provides quantized modulation of the pitch, based on the selected scale. This input tracks V/Oct standard when the PITCH MOD knob is fully clock-wise and it will be filtered thru the selected SCALE. If all semitones should be available please select chromatic scale.

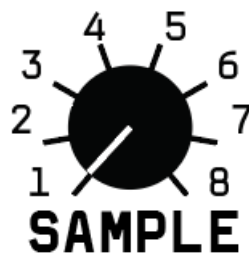
For more details, refer to the [Quantizer](#) section.

The input updates only when a sample is triggered.

Note: both the FREE and NOTE inputs can be calibrated to match your source of V/Oct signal and play perfectly in tune. To calibrate the inputs follow [this guide](#).

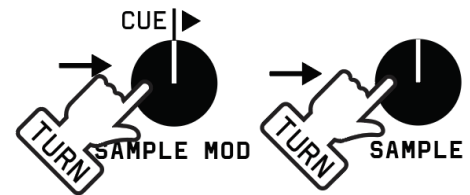
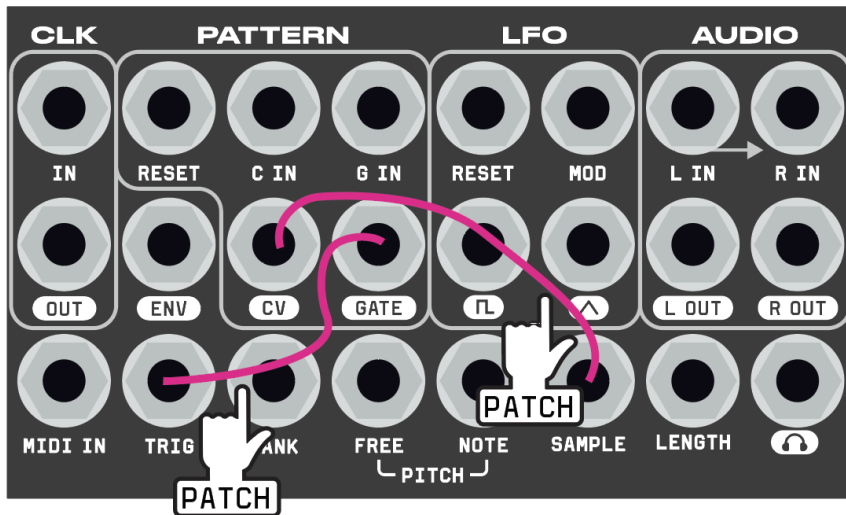
6. SAMPLE

In the default setting, the SAMPLE knob selects one of the 8 samples in the selected sample bank.

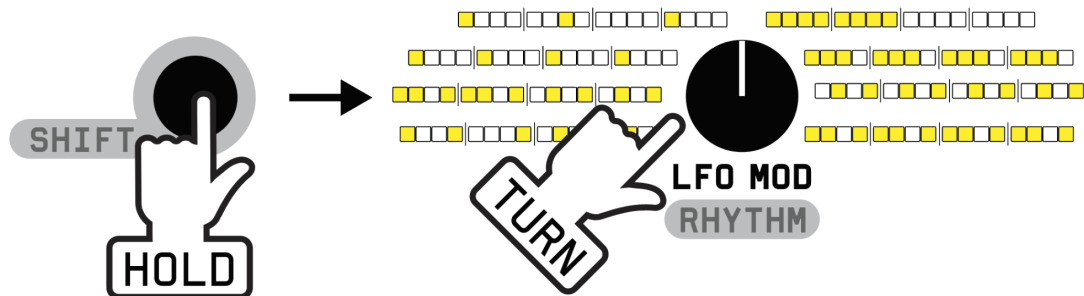


NOTE: The default distribution of 8 samples can be customized via the web editor, allowing you to set the range anywhere from 3 to 32 samples.

The **SAMPLE** and **SAMPLE MOD knobs** are your primary tools for uncovering beats. Begin with the following patch to get acquainted with their functionality.



SELECT GATE RHYTHM



Hold SHIFT and turn the LFO MOD knob to select a RHYTHM at the GATE output. The rhythms can be customized in the WEB APP. For further details, refer to the [Pattern Generator](#) section.

7. SAMPLE MOD (-5V to +5V)

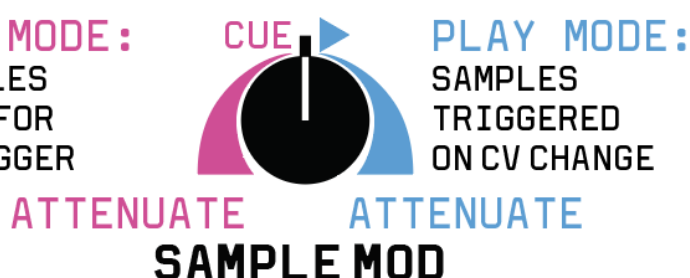
The SAMPLE MOD knob adjusts the amount of modulation applied to the SAMPLE parameter from the SAMPLE MOD patch point (indicated by the white arrow pointing toward the knob).

When the knob is centered, no modulation is applied.

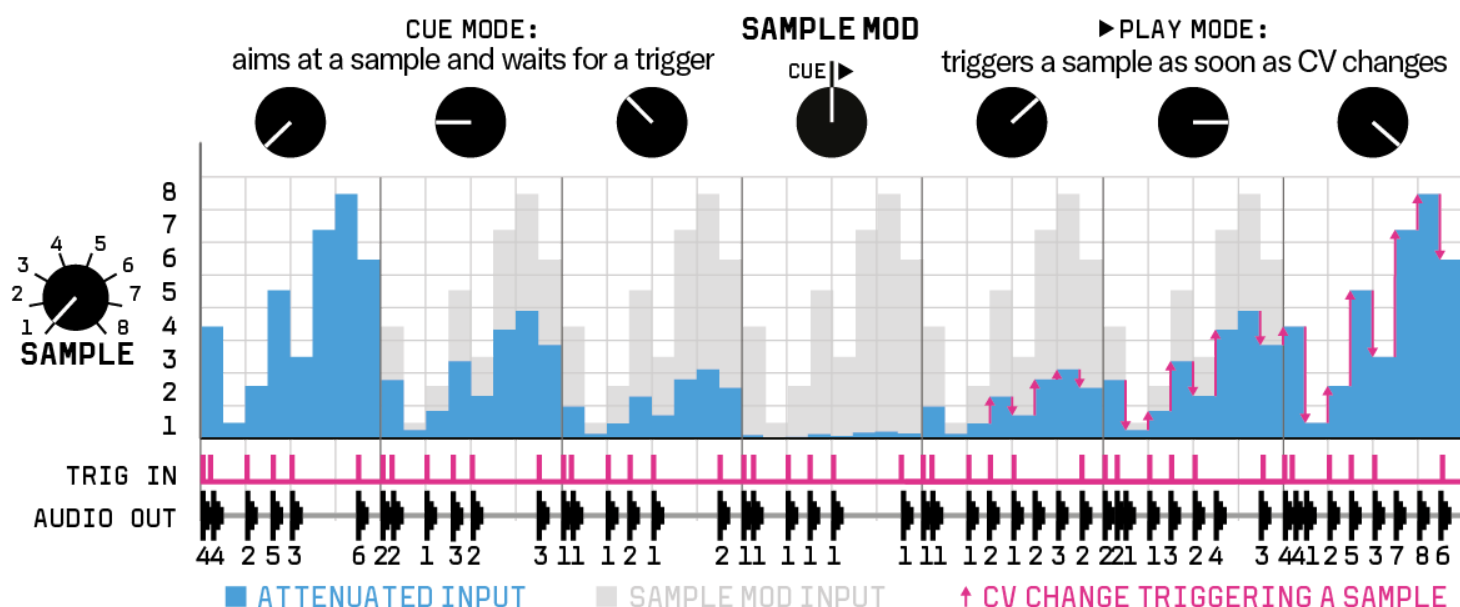
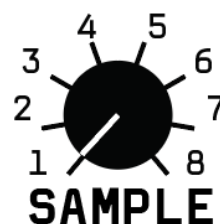
- **PLAY MODE:** Activated by turning the SAMPLE MOD knob to the **right**, where modulation is applied in a positive manner. In PLAY MODE, a sample is **triggered** as soon as the modulation crosses the threshold to a new sample.

- **CUE MODE:** Activated by turning the SAMPLE MOD knob to the **left**, where modulation is also applied in a positive manner. In CUE MODE, samples are **not triggered immediately**; instead, you **aim** at the samples and **wait for the TRIG** input to trigger them.

CUE MODE:
SAMPLES
WAIT FOR
A TRIGGER



PLAY MODE:
SAMPLES
TRIGGERED
ON CV CHANGE

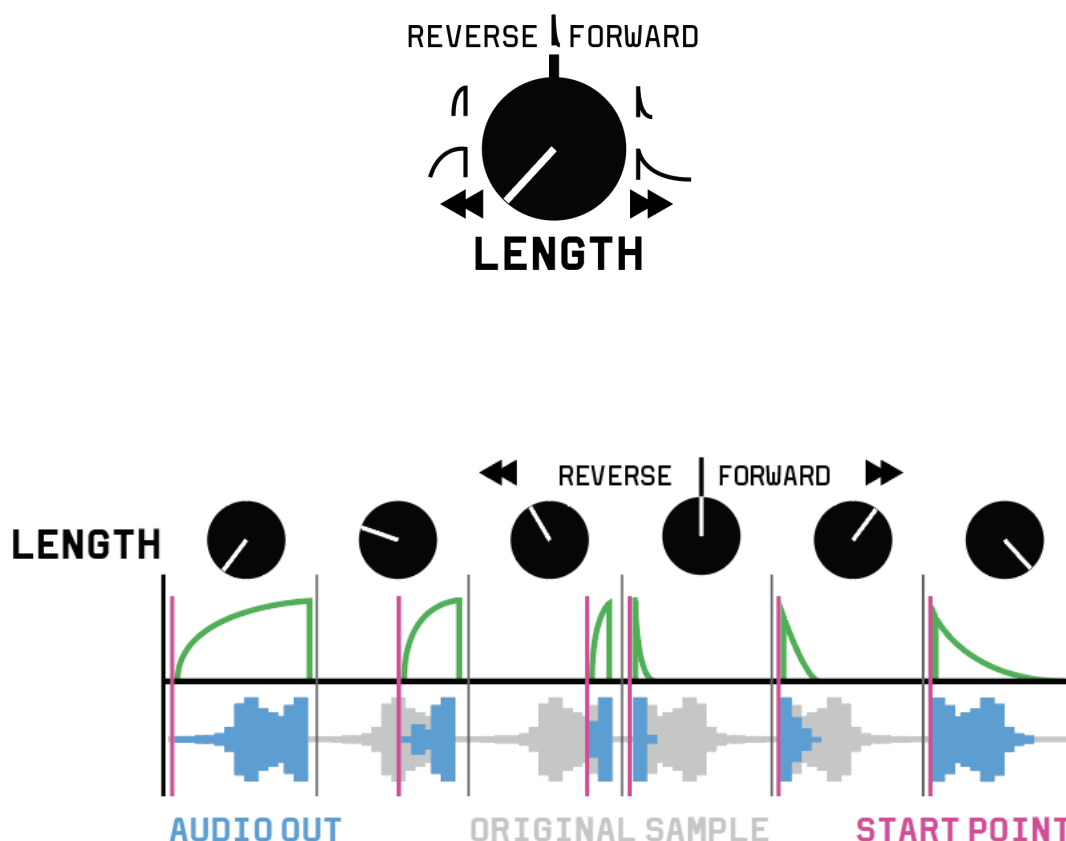


Off-Grid Sequencing: When using a triangle LFO to modulate the **SAMPLE MOD**, you have two options:

- **CUE MODE:** Stay on the grid.
- **PLAY MODE:** Generate off-grid triggers. The **SAMPLE MOD** increases density in PLAY MODE.

The LFO can be either synced or unsynced, and the **TRIG input** can be used or left unused, depending on your preference.

- Turning the knob to the **right** extends the decay envelope and plays the sample forward.
- Turning the LENGTH knob to the **left** extends the attack envelope and plays the sample backward.



9. LENGTH MOD (-5V to +5V)

The LENGTH MOD input controls modulation of the LENGTH knob. To adjust the amount of modulation, hold SHIFT and turn the LENGTH knob.

- When the knob is centered, no modulation is applied.
- Turning the knob to the right applies positive modulation.
- Turning the knob to the left applies negative modulation.

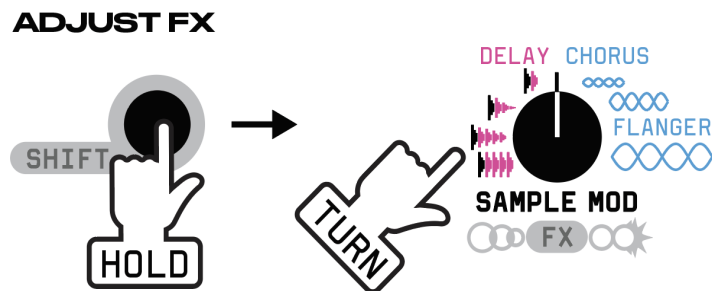
NOTE: The input updates only when a sample is triggered.

10. TRIG (-5V to +5V)

The TRIG input triggers the currently selected sample. You can also hit/tap the SHIFT button to trigger the sample manually.

11. FX

Hold the SHIFT button and turn the SAMPLE MOD knob to apply effects to your samples. When the knob is centered, no effect is applied.

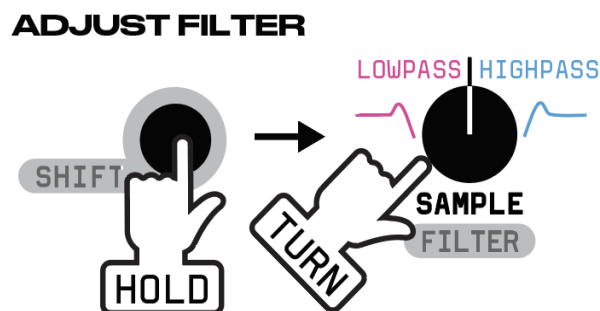


To the left, a simple delay effect is applied. The delay time is always synchronized to the tempo and set to 3/8th of a note.

To the right, a combination of chorus, flanger, and soft-clipping distortion is added to your samples. The further you turn the knob, the more pronounced the flanging resonance becomes.

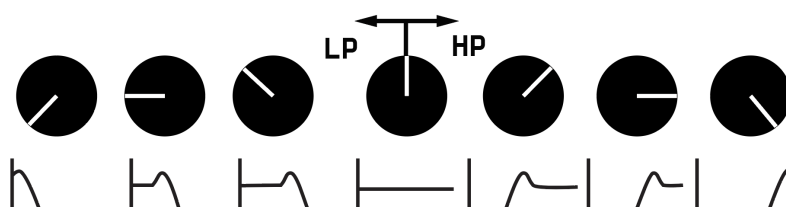
12. FILTER

The **FILTER** allows you to adjust the brightness or darkness of your effects.



👉 🎛️ Hold **SHIFT** and turn the **SAMPLE knob** to control the **FILTER**:

- **Middle position:** The filter is open.
- **Left position:** Acts as a lowpass filter.
- **Right position:** Becomes a highpass filter.

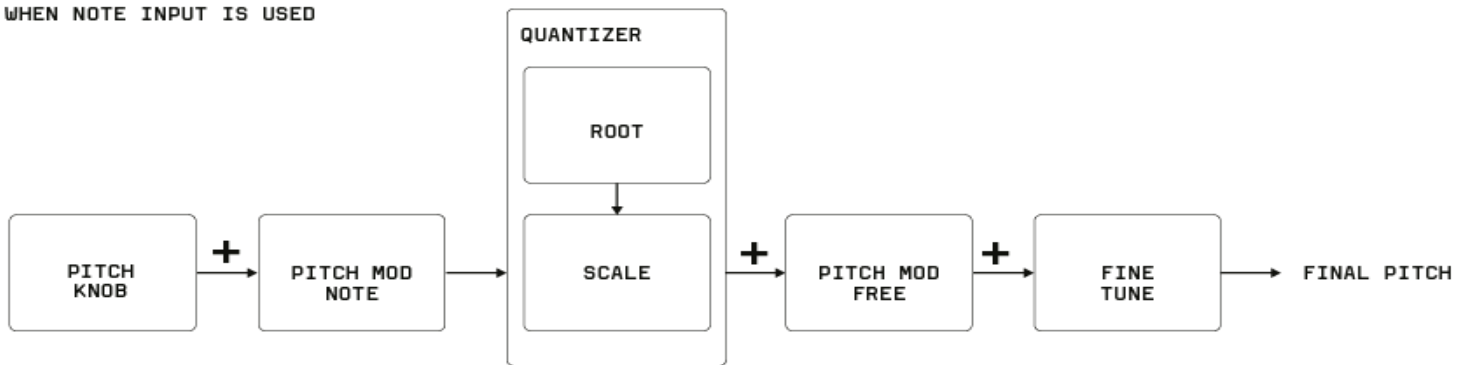


QUANTIZER

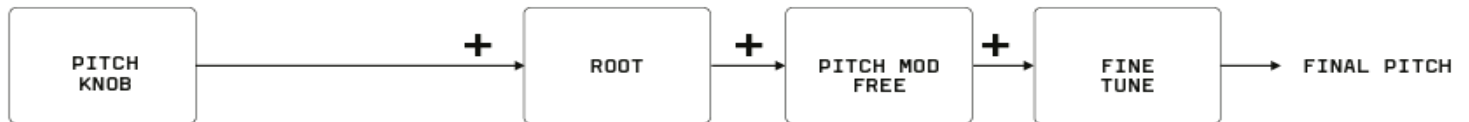
You can play samples quantized to pitch in a musical scale. By default, the PITCH knob is not quantized. The sample pitch is aligned automatically when there is a change at the NOTE PITCH MOD input or when you preview the scale by holding BANK and turning the PITCH knob.

The NOTE PITCH MOD patch point modulates the pitch in a quantized manner, based on the selected scale. It updates the pitch only when the sample is triggered.

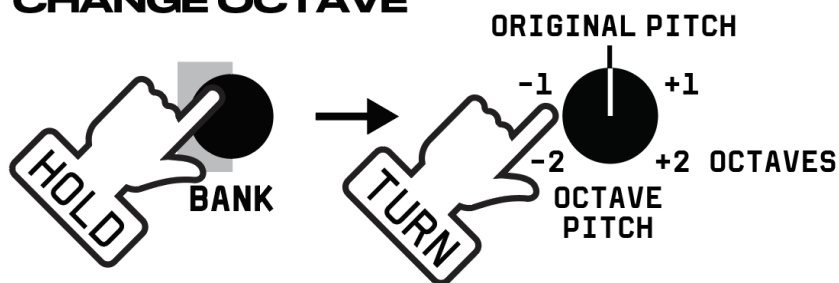
WHEN NOTE INPUT IS USED



WHEN NOTE INPUT IS NOT USED

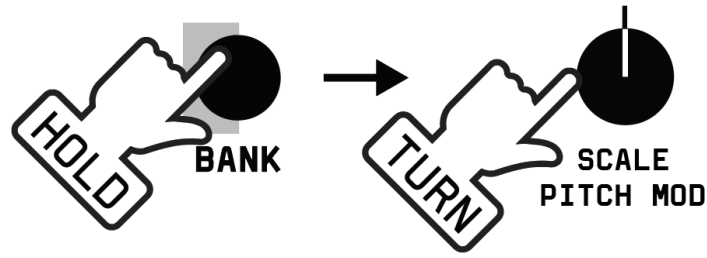


CHANGE OCTAVE

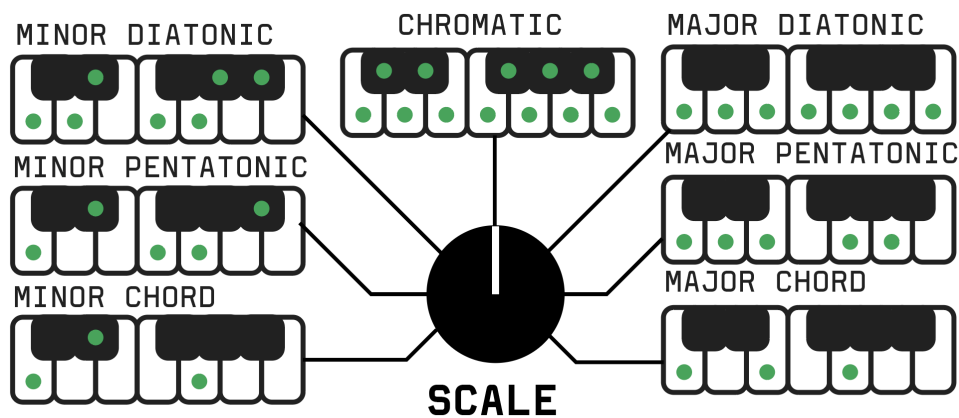


👉🎛️ Hold **BANK** and turn the **PITCH knob** to select the octave. The sample will be triggered each time the octave is changed.

SELECT SCALE

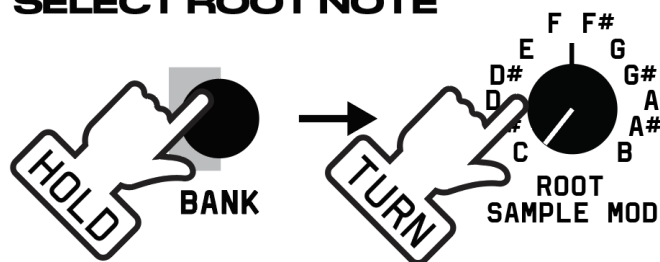


👉🔌 Hold **BANK** and turn the **PITCH MOD knob** to select the quantizer scale. When the scale changes, the lights will briefly dim. The following picture illustrates this with the **ROOT** set to **C**, assuming the sample itself is tuned to **C**.



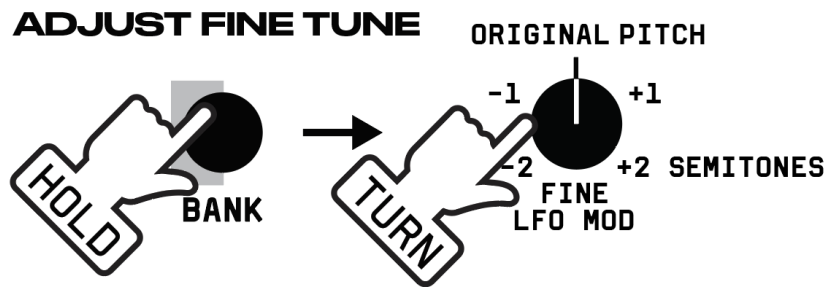
You can edit all scales via the [web app](#) when loading samples. Refer to the [SAMPLE LOADER WEB APP](#) section for more details.

SELECT ROOT NOTE



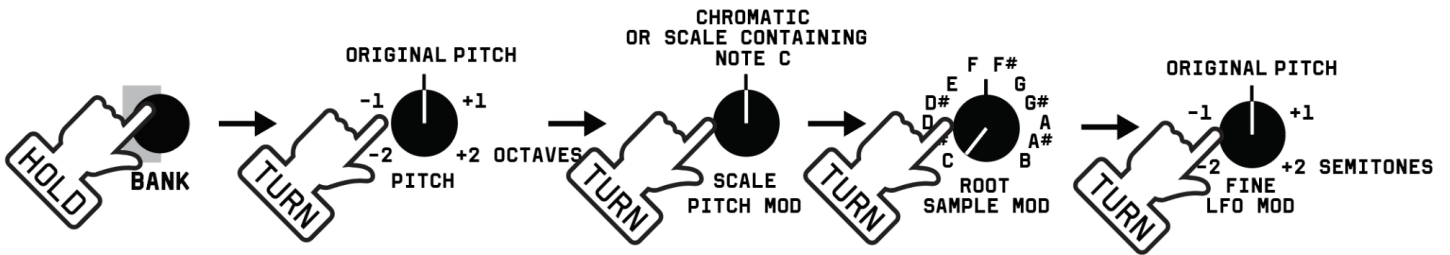
👉🔌 Hold **BANK** and turn the **SAMPLE MOD knob** to select the root note of the quantized scale. When the root note changes, the lights will briefly dim.

NOTE: It is expected that all loaded samples are tuned to **note C**.



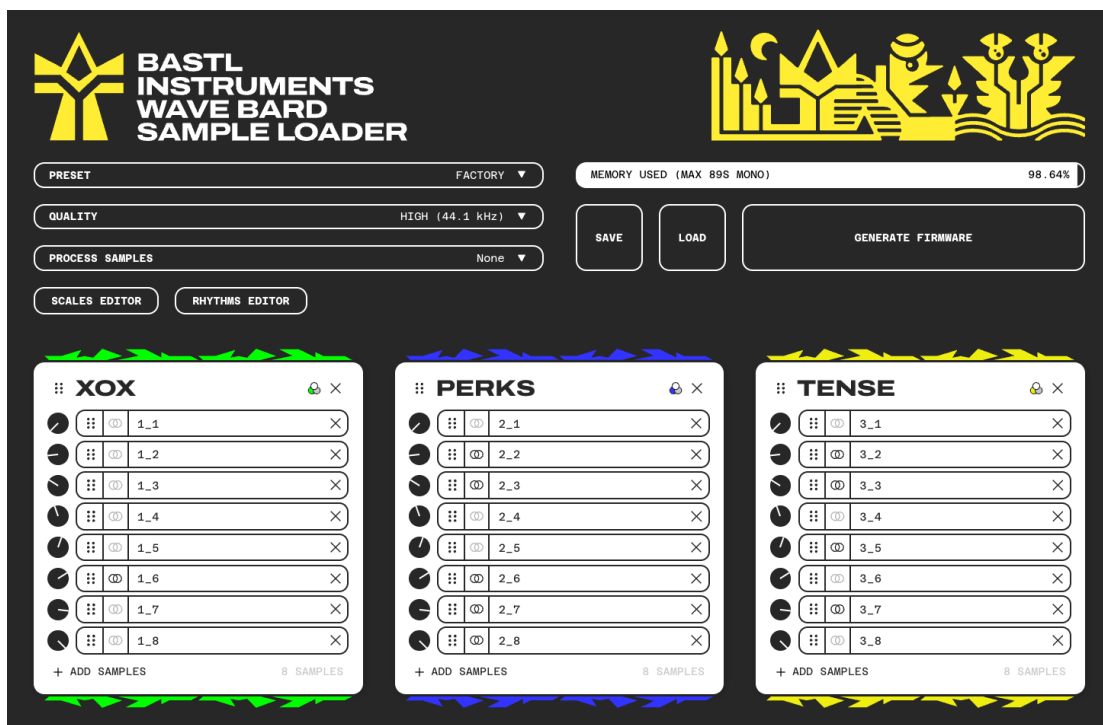
👉🔧 Hold **BANK** and turn the **LFO MOD** knob to adjust the fine-tuning by ± 2 semitones. This adjustment is applied after the quantizer.

PLAY SAMPLE AT ORIGINAL PITCH



SAMPLE LOADER WEB APP

Easily load your own samples, scales, and rhythms into the Wave Bard using the web app.



The web app generates a ***.uf2** file, which you download and copy to the Wave Bard while in boot mode.

To upload your own samples:

1. Access the [web app](#).
2. Upload and organize your samples into banks.
3. Download the **kastle2-wave-bard-version-custom.uf2** file via the "**GENERATE FIRMWARE FILE**" button in the web app.
4. Turn off the **Kastle2**. Hold **SHIFT** and turn it ON while connected to your computer via USB.
5. Copy the ***.uf2** file to the **RPI-RP2 disk** that appears on your computer.
6. Wait for 2–5 minutes. (It's normal for the dialog to show that it's preparing to copy for longer than expected.)

Upload, Organize, and Preview Samples

To start fresh, navigate to **PRESET** and load an empty template.



Click the + **ADD SAMPLES** button to add samples to your bank, or simply drag and drop samples directly from your computer into the app for quick organization and preview.



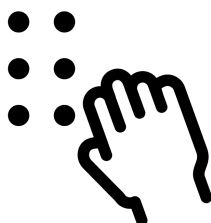
Supported Audio Formats: MP3, WAV, OGG, AAC, M4A, AIFF (varies by browser/platform).

Memory Size: 7.5 MiB.

Banks: Minimum: 1; Maximum: 32

Samples per Bank: Minimum: 3; Maximum: 32 (must be consistent across all banks).

TIP: You can drag and reorganize samples within the bank.



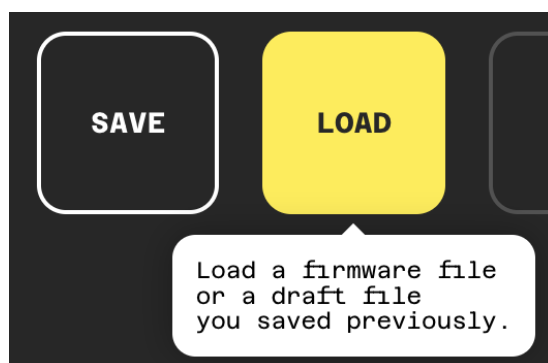
Preview Samples: Click on a sample's name to preview it.

Sample position: The knob located to the left of the sample indicates the position of the **SAMPLE knob**, which will access that sample in **Wave Bard**.

NOTE:

- Each bank can hold up to 32 samples.
- All banks must have the same number of samples to generate the firmware (this adjustment must be done manually).
- The default and recommended setup is 8 samples per bank.
- It is advisable to load samples tuned to **tone C** to ensure tonal accuracy with scales.

You can **SAVE the DRAFT** to revisit and continue editing your samples later using the **LOAD button**.



TIP:

- You can load either the draft or the *.uf2 file generated with the web app. However, working with the draft is recommended since the samples remain in their original quality.
- If you load the *.uf2 file, the samples will already have been processed by the app (e.g., if a sample was converted to mono in the app, it cannot revert to stereo), also the file name will be trimmed to 8 characters.

Memory

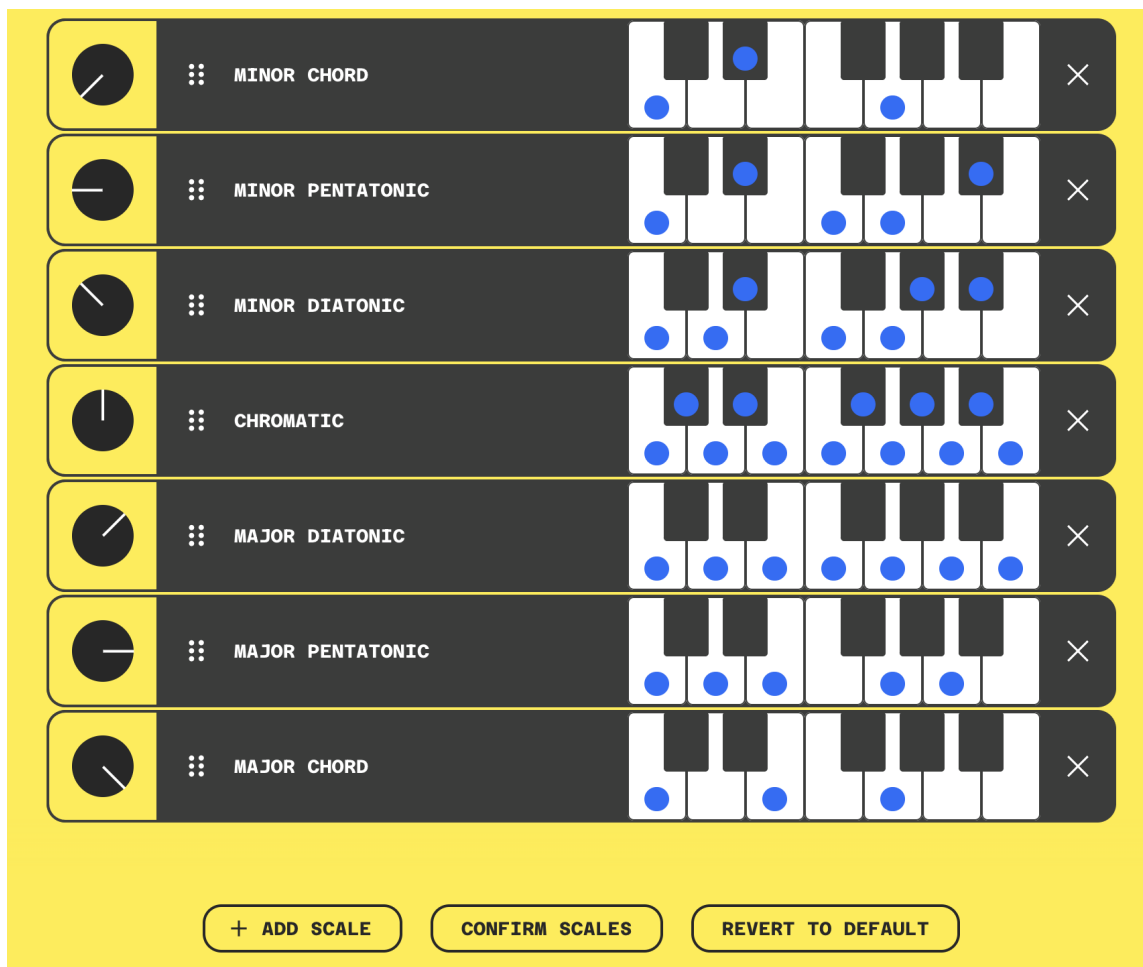
The sample memory in **Wave Bard** supports 89 seconds of audio in mono at 44.1kHz. If all samples are in stereo, the memory is reduced to 44.5 seconds. To optimize memory usage, combine mono and stereo samples strategically.

TIP:

- If you're running out of memory, check the **Process Samples** dropdown. Removing unnecessary silence from samples can free up additional memory.
- To accommodate much longer samples, reduce the **QUALITY settings**

Scales Editor

Click on the SCALES EDITOR button to access the editor.



Edit Scales

Click on the piano keys to edit your scales.

NOTE: Scales remain accurate if the loaded samples are tuned to **tone C**, the **ROOT note** is set to **C**, and the **FINE tune** knob is centered. Refer to the **Quantizer section** for additional details.

Preview and Manage Scales

- Preview the entire scale by clicking on its name.
- Rearrange scales by dragging the dots on the left side of each scale.
- Delete scales by clicking the **X** icon.
- Add new scales using the **+ADD SCALE** button.

Scale Limits

- Minimum number of scales: **3**; Maximum number of scales: **32**

Finalize Edits

- Use the **CONFIRM SCALES** button to save your changes.
- Undo edits with the **REVERT TO DEFAULT** button.

Rhythms Editor

Access the editor by clicking on the **RHYTHMS EDITOR** button.

On the **Wave Bard**, rhythms can be loaded by holding **SHIFT** and turning the **LFO MOD knob**. These rhythms will be sent as triggers through the **GATE** output.



Edit Your Rhythms

- Click on the steps to edit your rhythms.
- Preview the rhythm by clicking the **PLAY** button and stop it using the **STOP** button.
- Add new rhythms by clicking the **+ADD RHYTHM** button.

Manage Rhythms

- Rearrange the order of rhythms by dragging the dots on the left side of each rhythm.
- Delete rhythms by clicking the **X** icon.

Rhythm Limits

- Minimum number of rhythms: **3**; Maximum number of rhythms: **32**

Finalize Edits

- Save changes by clicking the **CONFIRM CHANGES** button.
- Undo edits with the **REVERT TO DEFAULT** button.

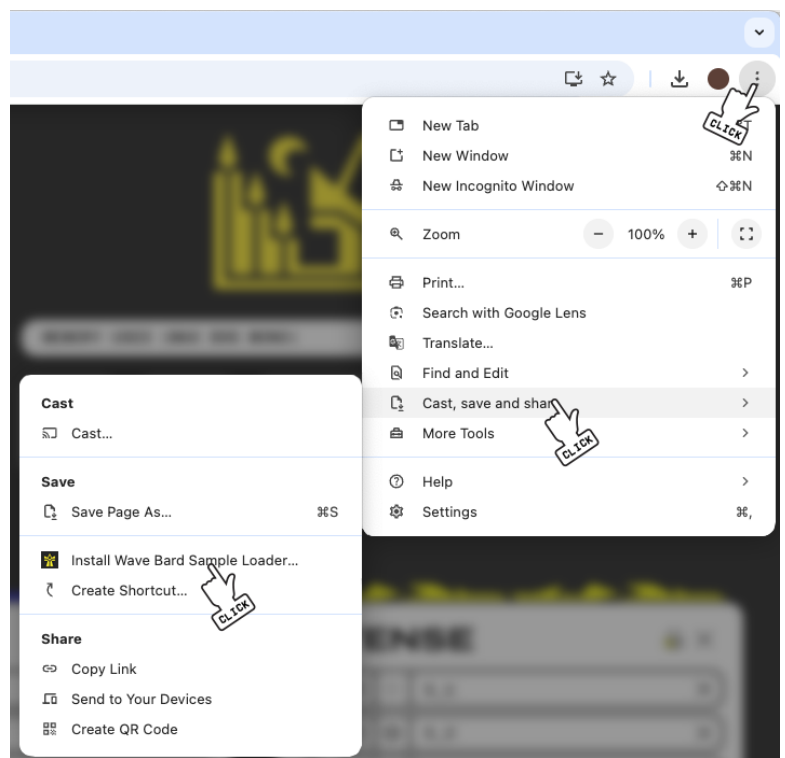
Supported Browsers

Chrome 76+, Edge 79+, Firefox 76+, Safari 13+, and their desktop derivatives.

App Offline Mode

Although the [Wave Bard Sample Loader](#) is a web app, you can install it as a local application using **Chrome** (or its derivatives) and access it even without an internet connection.

NOTE: Safari and Firefox are not supported due to their lack of PWA (Progressive Web App) technologies.

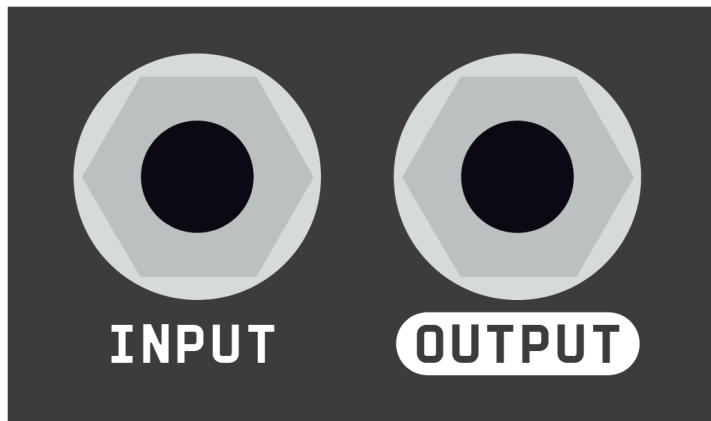


PATCHBAY

The **Patchbay** on the **Citadel** consists of many inputs and outputs.

Patchbay Details

- **Outputs:** Marked with a label inside white outline.
- **Inputs:** Labeled with white text without any outline.



Input Ranges

- FREE IN and NOTE IN **-0.2V to 7V**
- CLK IN, RESET IN, C IN, G IN **0V to 5V**
- LFO MOD, BANK IN, SAMPLE IN, LENGTH IN, LFO RESET, TRIG IN: **-5V to +5V**
- L/R IN: **-10V to +10V**

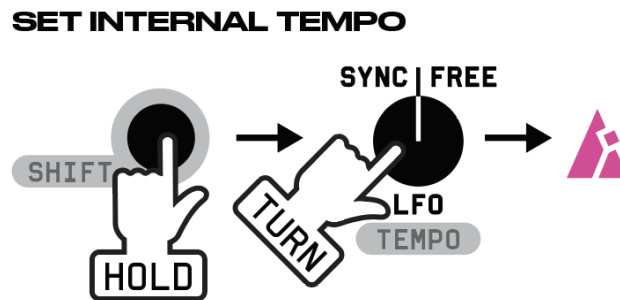
Output Ranges:

- CLK OUT, ENV OUT, CV OUT, LFO TRI OUT, LFO PULSE OUT: **0V to +5V**
- L/R OUT **-5V to +5V**
- Headphone output up to 2Vpp (line level compatible)

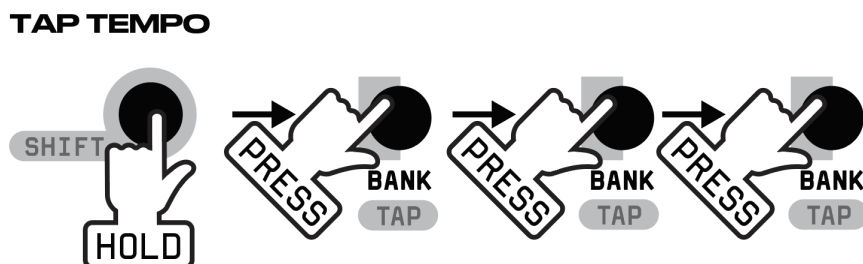
TEMPO GENERATOR

The **Tempo Generator** operates independently from the **LFO** but allows the **LFO** to be synchronized to the tempo. The tempo source can be either internal or external.

Set the Internal Tempo



👉🖱️ Hold **SHIFT** and turn the **LFO knob**, indicated by the magenta-colored metronome light.

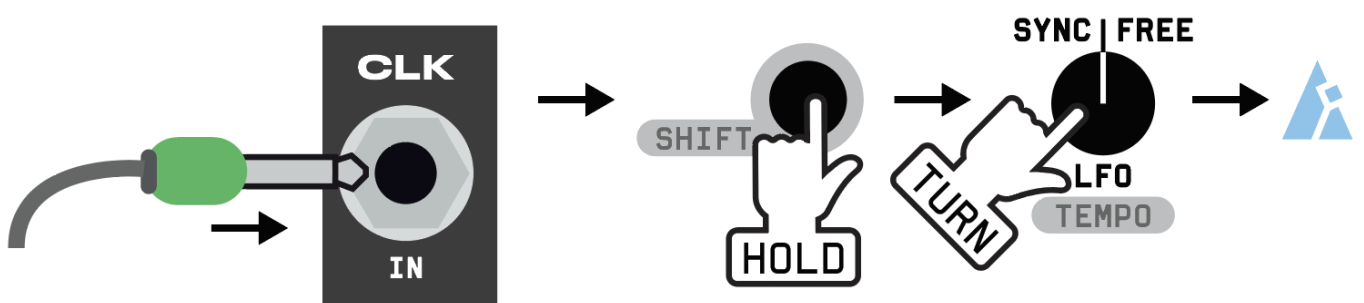


👉👉 Hold **SHIFT** and press **BANK** repeatedly to **TAP** the tempo.

Sync to External Tempo

Connect an analog clock signal to the **SYNC IN**.

SET EXTERNAL TEMPO DIVIDER



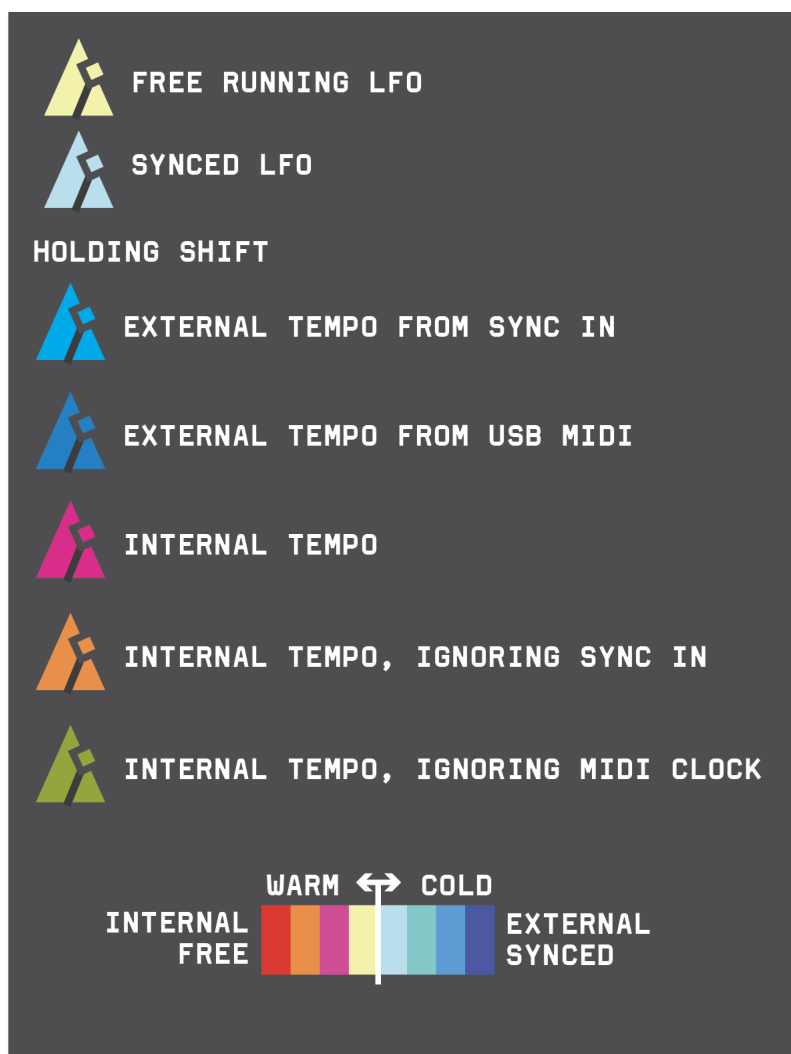
👉 🕒 Hold **SHIFT** and turn the **LFO knob** to select the tempo divider, indicated by the cyan-colored metronome light.

While holding the **SHIFT button**, the metronome light indicates the clock status:

- **Light blue (cyan):** External tempo is active.
- **Light pink (magenta):** Wave Bard is running on the internal clock.
- **Blue:** Wave Bard is running on the USB MIDI clock. See the [MIDI](#) section for more info.
- **Orange:** Wave Bard is using the internal clock and ignoring the external analog clock.
- **Khaki:** Wave Bard is using the internal or external clock and ignoring the MIDI clock.

NOTE: The regular clock priority is: USB MIDI clock, over the SYNC IN, over the internal clock.

NOTE: To toggle between allowing or ignoring the external clock or MIDI clock, refer to the [Advanced settings](#) section.



SYNC

SYNC IN

To sync the **Wave Bard** to an external clock, connect an analog clock source to the **SYNC IN** jack. The clock signal will be detected on the left channel of the jack and used as the tempo source.

While holding the **SHIFT button**, the metronome light blinks **light blue (cyan)** to indicate that external tempo is active.

Adjust the tempo divider/multiplier by holding **SHIFT** and turning the **TEMPO knob**.

If the clock signal is not detected for more than 2 seconds, the **Pattern Generator** will reset to its first step, ensuring alignment with your external sequencers when the clock resumes.

NOTE: When the **SYNC IN** jack is connected, the **Wave Bard** will always wait for the external clock and will not switch to the internal clock—unless the external clock is set to be ignored. See the [Advanced settings](#) section for more details.

If a jack cable is not connected to the **SYNC IN** jack, you can instead patch a clock signal to the **SYNC IN** patch point in the **patch bay**. If a clock is detected there, the **Wave Bard** will automatically sync to that clock.

When the clock patched through the **patch bay** is not detected for more than 2 seconds (while no jack is connected to **SYNC IN**), the **Wave Bard** will switch back to its internal clock.

NOTE: When connecting the **LFO PULSE output** to the **SYNC IN patch point**, ensure the **LFO knob** is in the free (unsynced) section to avoid glitches.

SYNC OUT

Connect **SYNC OUT** to the clock input of a receiving instrument to synchronize it with the clock of **Wave Bard**.

You can set the **TEMPO** on the **Wave Bard** by holding **SHIFT** and turning the **LFO knob**.

Additionally, you can patch from the **SYNC OUT** patch point to various inputs.

SYNC THRU

When an external clock is connected to the **SYNC IN**, the **SYNC OUT** acts as a **SYNC THRU**. While you can adjust clock dividers/multipliers on the **Wave Bard**, all downstream devices will remain synchronized with the master clock.

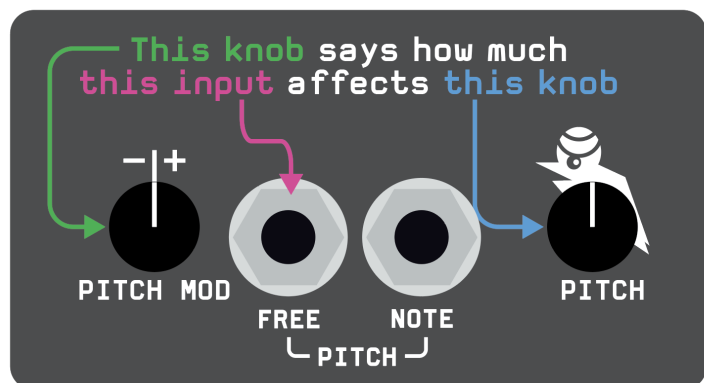
USB MIDI sync

Wave Bard can be synced to TRS MIDI CLOCK or USB MIDI clock. Please see the [MIDI chapter](#) for more information.

MODULATION

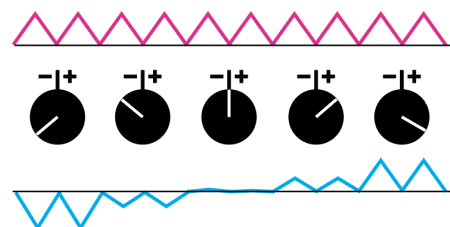
The **Citadel** features several modulation sources:

- The **Pattern Generator** is always synced to the tempo.
- The **LFO** can operate in either synced or free mode.
- The **ENV** serves as the primary envelope applied to the samples.



LFO

MODULATION EFFECT



Envelope (ENV) (0V to +5V)

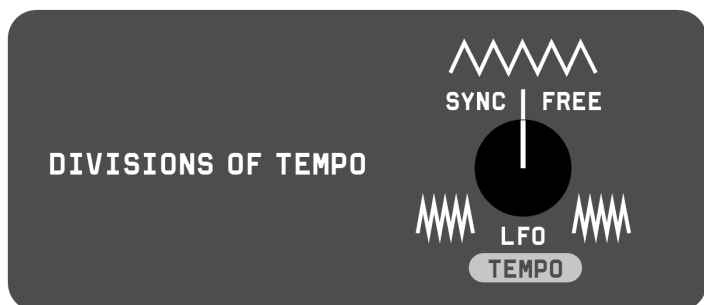
The **ENV output** originates from the main **Wave Bard** envelope, adjusted by the **LENGTH knob**. This envelope controls the loudness of samples, allowing you to shorten their decay or add attack when samples are reversed. For additional details, refer to the **LENGTH chapter**.

The **ENV output** can also be used to modulate the **FREE PITCH MOD** or other parameters.

LFO (0V to +5V)

The **LFO speed** is adjusted via the **LFO knob**:

- At the **middle position**, the LFO operates at its slowest speed.
- Turning the knob **left syncs** the LFO to the tempo, indicated by **cold white light**, with the knob setting the tempo divider.
- Turning the knob **right sets** the LFO to **free-running mode**, indicated by **warm white light**, with increasing speed as the knob turns further.



LFO Outputs and Inputs

LFO offers **TRI** and **PULSE** outputs, **RESET** input and **LFO MOD** input.

- **LFO TRI**: The triangle shape is variable by patching **LFO PULSE** to **RESET** or **LFO MOD** (see below).
- **LFO PULSE**: Outputs a high signal when the triangle is rising.
- **LFO RESET**: The rising edge resets the LFO to the highest point of the triangle waveform.
- **LFO MOD**: Attenuverting input allows for variable LFO shapes when **LFO PULSE** is patched into it.

NOTE: Modulation does not switch between synced and free LFO modes but only speeds up or slows down the LFO.

Changing Modulation Shapes

Modulation shapes can be adjusted through **patch programming**.

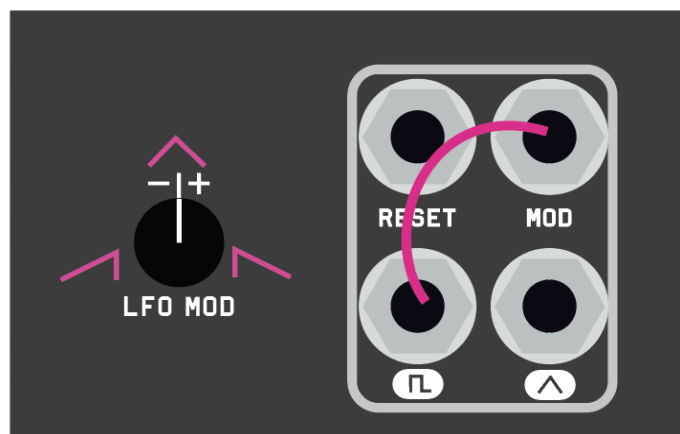
NOTE: The following methods will also affect the LFO speed.

The **LFO PULSE** output changes its pulse width, remaining high while the triangle rises and low while it falls.

LFO Patch Programming variants

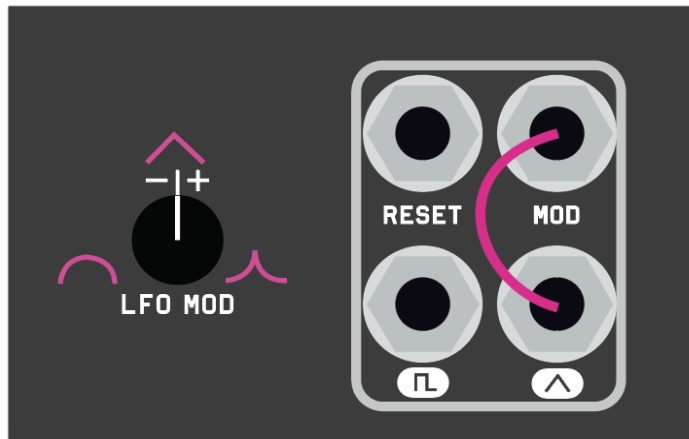
■ Ramp or Saw Shape:

Patch the **LFO PULSE** to the **LFO MOD** input and adjust the **LFO MOD** to tilt the triangle into a ramp or saw shape. Adjust the **LFO knob** to fine-tune the result, as turning the **LFO MOD** will affect the LFO frequency.



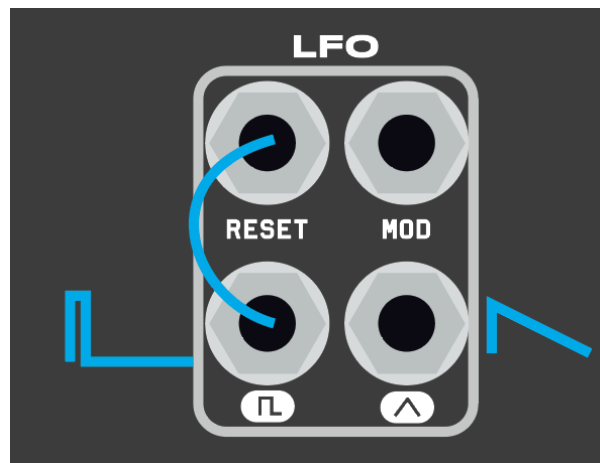
■ Exponential or Logarithmic Shape:

Patch the **LFO TRI** to the **LFO MOD** input and adjust the **LFO MOD** to make the triangle shape more exponential or logarithmic.



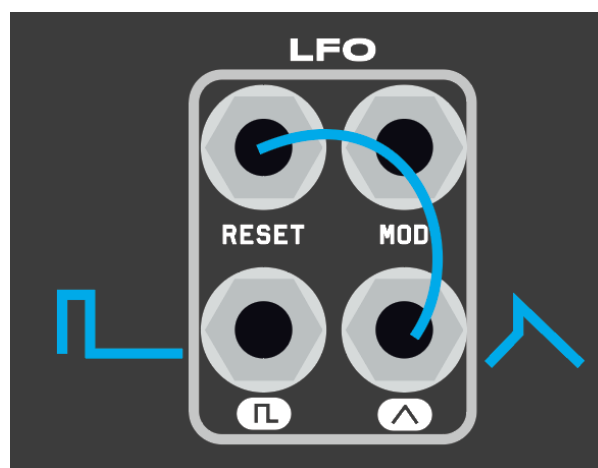
■ Saw Wave Shape:

Patch the **LFO PULSE** to the **LFO RESET** to transform the triangle shape into a saw wave.



■ Hybrid Wave Shape:

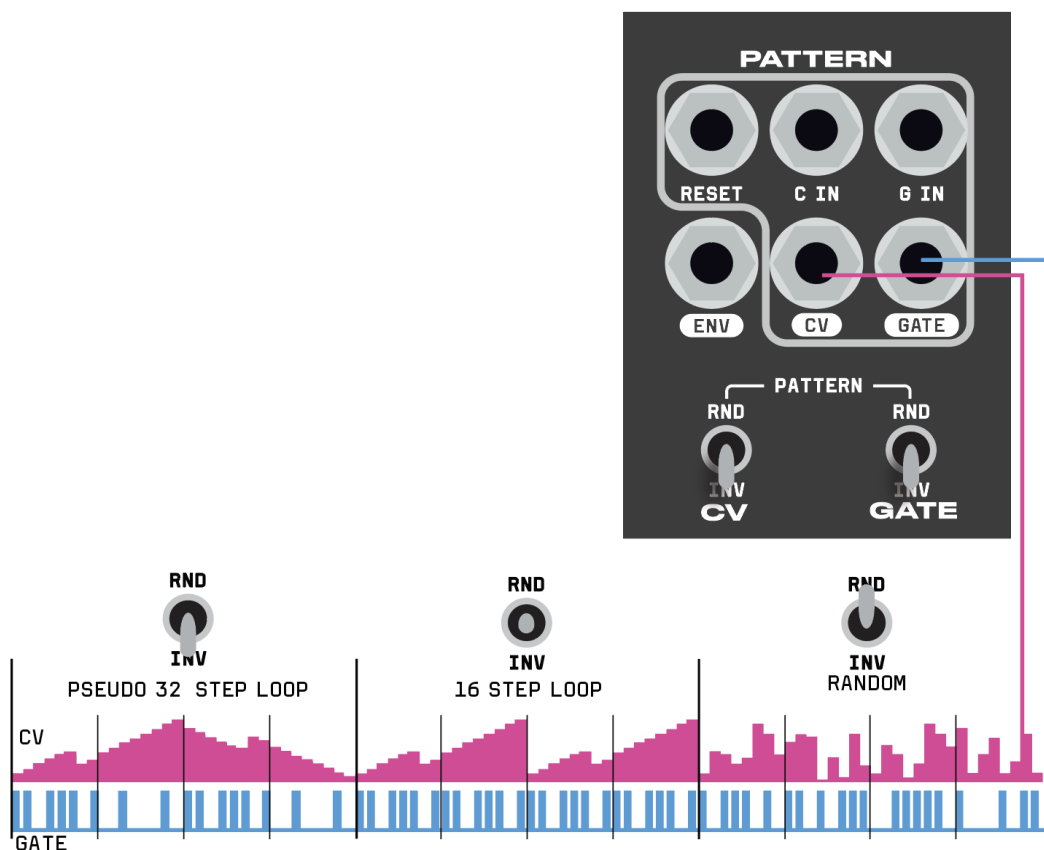
Patch the **LFO TRI** to the **LFO RESET** to create a hybrid wave from the triangle shape.



Pattern Generator (0V to +5V)

The **Pattern Generator** produces two signals: **GATE** and **CV**, both of which are always clocked by the tempo and run on a 16-step sequence.

- **GATE**: Provides rhythmic information, with the gate length fixed at 75% of the step duration.
- **CV**: Outputs varying stepped voltages.



Reset

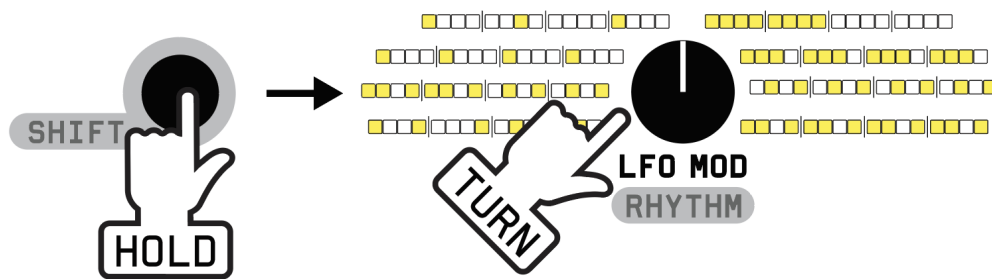
The **GENERATOR RESET** input (PATTERN R – the middle pin) resets both the **GATE** and **CV** sequences upon detecting a rising edge.

- This can be used for synchronization purposes.
- It can also shorten the pattern sequence, for example, by patching in the **LFO**.

Gate

👉 🖱️ Hold **SHIFT** and turn the **LFO MOD** knob to generate the **RHYTHM sequence** at the **GATE** output. The sequence will be selected from a table of patterns, which are editable via the [WEB APP](#).

SELECT GATE RHYTHM



The **GATE PATTERN SWITCH** is normalized to the GATE GENERATOR input **G IN** and is only active when there is no jack in the G IN. It modifies the **GATE sequence** in the following ways:

- Switch in the **MIDDLE** or G IN voltage in between 1.6 and 3.2V: the gate sequence remains unchanged.
- Switch in the **UP** position or G IN voltage above 3.2V: the current position in the gate sequence is randomized.
- Switch in the **DOWN** position or G IN voltage below 1.6V: the current position in the gate sequence is inverted (inactive steps become active and vice versa).

TIP: Try flipping the switch temporarily to alter the sequence partially.

CV

The **CV PATTERN SWITCH** is normalized to the CV GENERATOR input **C IN** and is only active when there is no jack in the C IN. It modifies the **CV sequence** in the following ways:

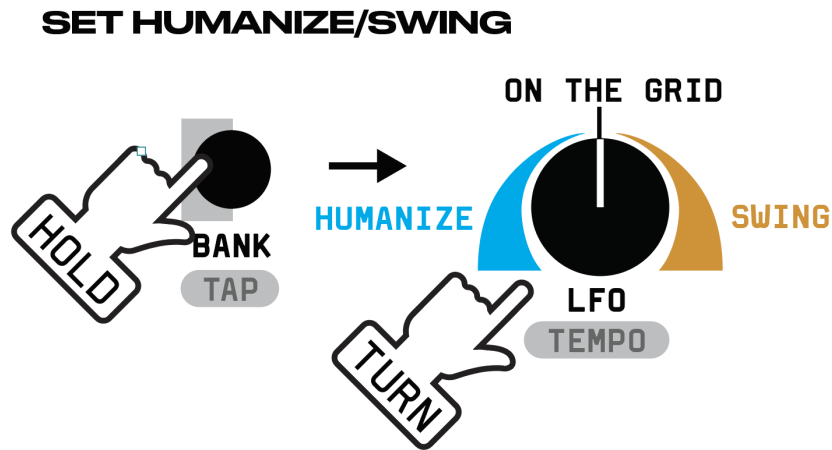
- Switch in the **MIDDLE** or C IN voltage in between 1.6 and 3.2V: the CV sequence remains unchanged.
- Switch in the **UP** position or C IN voltage above 3.2V: the current level of the CV sequence is randomized.
- Switch in the **DOWN** position or C IN voltage below 1.6V: the current level of the CV sequence is inverted around a center at 2.5V (e.g., 0V becomes 5V, 1V becomes 4V, and 2V becomes 3V, etc.).

TIP: Connect varying voltages to the C IN to create semi-random and evolving sequences.

Try flipping the switch temporarily to alter the sequence partially until it fits your needs.

NOTE: The switch in the **DOWN** position or C/G IN voltage below 1.6V the sequence will continuously invert itself, making it appear **32 steps long**.

HUMANIZE/SWING

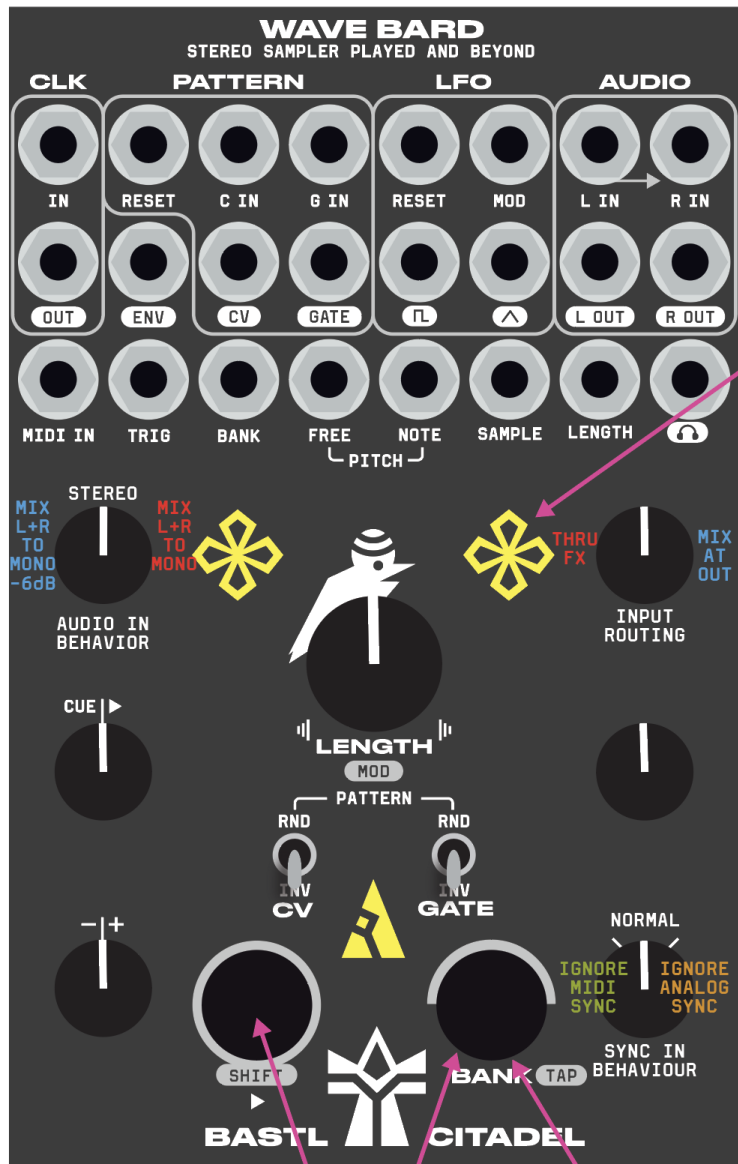


Hold **BANK** and turn the **LFO** knob (bottom right) to adjust timing shifts applied to **CV** and **GATE** outputs:

- **To the right:** SWING is applied (orange) = delaying every second 16th note by up to 50% based on the knob position
- **To the left:** HUMANIZE is applied (cyan) = delaying the timing of CV and GATE changes in an alternate predefined way
- **In the center:** of the knob, the CV and GATE render exactly on the grid

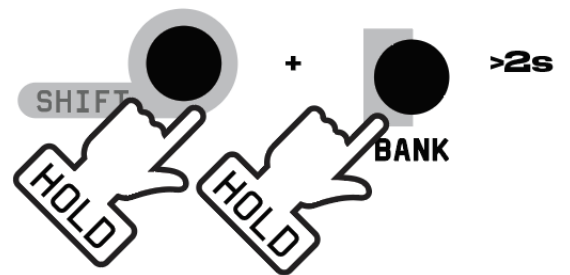
Advanced Settings

Press and hold both the **SHIFT** and **BANK** buttons for over 2 seconds to enter **Advanced Settings mode**. This mode unlocks expanded connectivity options, allowing you to enhance the capabilities of your **Wave Bard**.



SIGNAL MIDI CHANNEL

ENTER ADVANCED SETTINGS



SHIFT+BANK >2s:
ENTER/LEAVE ADVANCED SETTINGS

HOLD FOR MIDI LEARN

SHIFT + TAP BANK X TIMES TO SET MIDI CHANNEL TO X

Audio Input Behavior

While in **Advanced Settings mode**, adjust the **PITCH MOD** knob, and the **top left light** will change colors to indicate the input mode:

- **BLUE**: mix L+R inputs to Mono with -6dB gain. Turn the knob **left**.
- **WHITE**: Stereo input. Leave the knob in the **center position**.
- **RED**: mix L+R inputs to Mono. Turn the knob **right**.

Note: when using the RED mono mix setting and plugin only into the L input the signal will effectively boost +6dB, because it is normalised to the R input the signals will add up.

Input Routing

Use the **PITCH knob** to determine the internal routing of **AUDIO IN**:

- **Turn Right (BLUE LIGHT)**: Mix the AUDIO IN with the **Wave Bard** sounds at the output.
- **Turn Left (RED LIGHT)**: Route the AUDIO IN through the **Wave Bard's** effects.

Ignore USB MIDI Clock / Sync Input

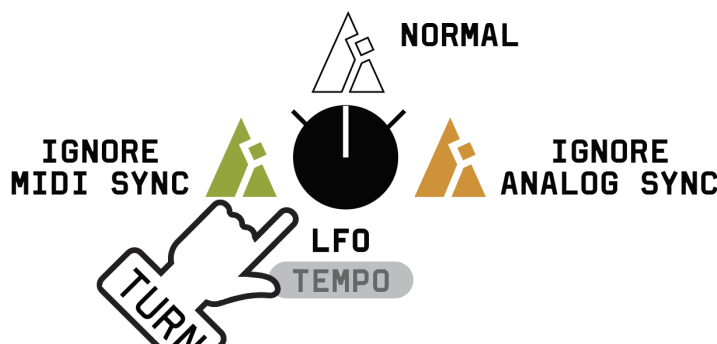
You can configure your **Wave Bard** to always use its internal clock and ignore the external clock connected via the **TRS** or **USB MIDI, SYNC IN jack** or **patch input**.

This allows the **SYNC IN jack** to be repurposed for inputting external voltages and routing them to desired destinations.

While in **Advanced Settings mode**, adjust the **LFO knob**, and the **LFO light** will change colors:

- **KHAKI**: Ignore MIDI Clock (turn the knob **left**).
- **WHITE**: Normal operation (knob in the **center** position) = honors the regular clock priority: MIDI clock, over the SYNC IN, over the internal clock.
- **ORANGE**: Ignore sync input (turn the knob **right**).

SET INPUT CLOCK HANDLING



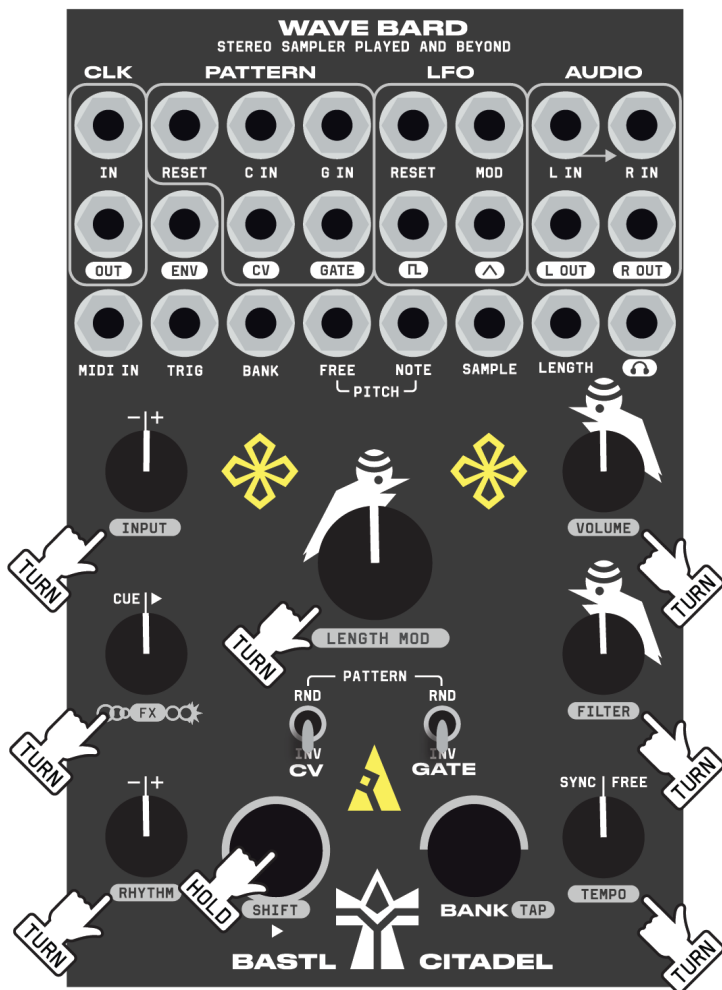
LFO MOD assignable destination

You can change the destination of the **LFO MOD** input and knob so you can control secondary functions (normally accessed when **SHIFT** or **BANK** is held). This greatly enhances the modulation, sound design, and sequencing capabilities.

When you assign modulation to any secondary parameter, it will be added to that parameter's knob position. This means that if you have the parameter in the middle position, you can modulate it either way by applying the LFO MOD attenuverter.

Hold **SHIFT** and turn a potentiometer to assign **LFO MOD** patch input + attenuverter to a parameter tweaked with the **SHIFT** button

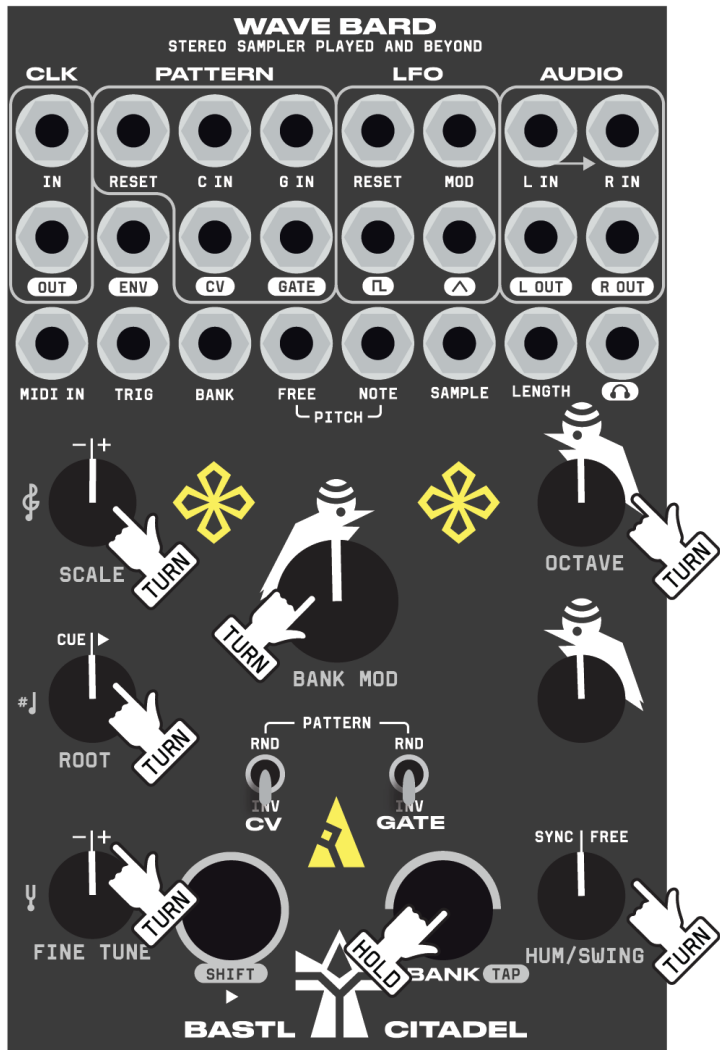
IN ADVANCED SETTINGS
SHIFT + TURN KNOB TO ASSIGN LFO MOD TO THE SHIFT+KNOB DESTINATION
ALL LIGHTS BLINK WHEN A CHANGE IS MADE



Example: Hold **SHIFT** and turn the **LFO** knob to adjust the **TEMPO** with CV. If you are synced to external tempo, the tempo divider will be modulated.

In Advanced settings, hold **BANK** and turn a potentiometer to assign LFO MOD patch input + attenuverter to a parameter tweaked with the **BANK** button

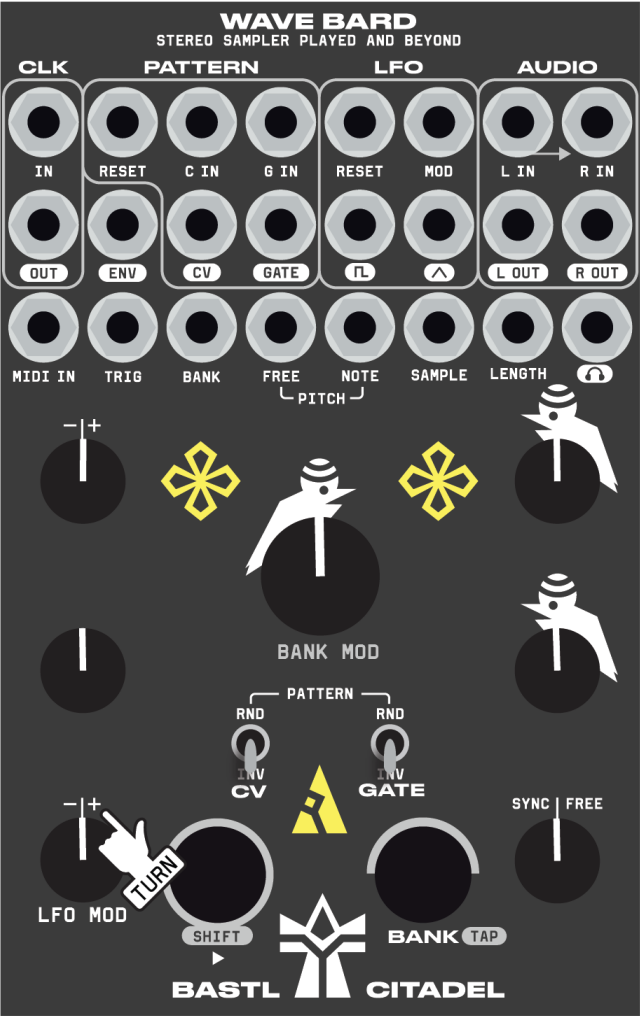
IN ADVANCED SETTINGS
BANK + TURN KNOB TO ASSIGN LFO MOD TO THE BANK+KNOB DESTINATION
ALL LIGHTS BLINK WHEN A CHANGE IS MADE



Example: Hold **BANK** and turn the **LFO** knob to adjust the **HUMANIZE/SWING** with CV.

In **Advanced Settings**, turn the **LFO MOD** pot without holding any button to clear the custom assignment.

IN ADVANCED SETTINGS
TURN LFO MOD KNOB (WITHOUT HOLDING ANY BUTTON) TO RETURN TO DEFAULT LFO
MOD ASSIGNMENT
ALL LIGHTS BLINK WHEN A CHANGE IS MADE



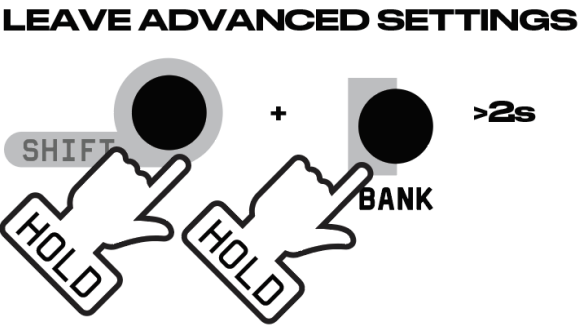
Wave Bard available assignments for LFO MOD

Controls	Destination
LFO MOD	LFO Mod (default)
SHIFT+PITCH MOD	Input Volume
SHIFT+SAMPLE MOD	FX
SHIFT+LFO MOD	Rhythm
SHIFT+LENGTH	Length Mod-Mod
SHIFT+PITCH	Output Volume
SHIFT+TIMBRE	Filter
SHIFT+LFO	Tempo
BANK+PITCH MOD	Scale
BANK+SAMPLE MOD	Root Note

BANK+LFO MOD	Fine Tune
BANK+LENGTH	Bank Mod-Mod
BANK+PITCH	Octave
BANK+LFO	Humanize/Swing

Note: Due to the hardware limitations, the input and volume modulation are not a clean, all-purpose VCA. However, it can be used as a tremolo or creative effect. Especially the volume modulation can boost the signal into a distortion

To exit **Advanced Settings mode**, hold **SHIFT** and **BANK** for 2 seconds.



MIDI IMPLEMENTATION

Citadel has a TRS MIDI Input (Type A) jack in the patch bay for receiving MIDI. It also can send and receive MIDI via the USB MIDI connector on the back of the module.

Setting the MIDI channel

Citadel uses the same MIDI channel for both input and output.

NOTE:

The MIDI channel applies to Note, Pitch Bend, and CC (Control Change) messages. As the MIDI Clock messages do not carry channel information, channel settings have no effect on clock transmission or reception.

You can **learn or set the MIDI channel** in the Advanced settings mode. Enter (or leave) the Advanced Settings mode by holding **SHIFT** and **BANK** for 2 seconds.

Learn the MIDI channel



To MIDI learn the MIDI input/output channel, hold the BANK button for at least 1 second. The top right light will turn off.

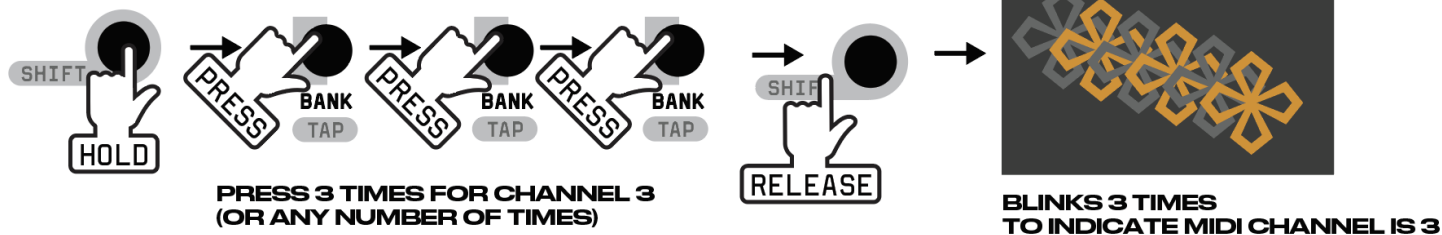
Send any MIDI message (Note, CC, or Pitch Bend). The channel of the received message will be assigned as the new MIDI input/output channel. The top right light will turn orange to confirm the assignment.

Release the BANK button. The top right light will blink to indicate the selected MIDI channel number (e.g., 3 blinks = channel 3).

NOTE: If BANK and SHIFT buttons are held simultaneously, the MIDI Learn function will NOT be activated.

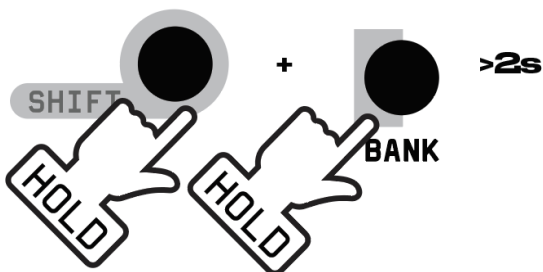
Set the MIDI channel directly

DEFINE MIDI CHANNEL



Hold the SHIFT and press the BANK button a number of times to set the MIDI channel number manually. The number of presses will be counted once the SHIFT button is released and the top right led will blink the number of times to indicate the MIDI channel number.

LEAVE ADVANCED SETTINGS



Receiving MIDI Sync (Real Time Messages)

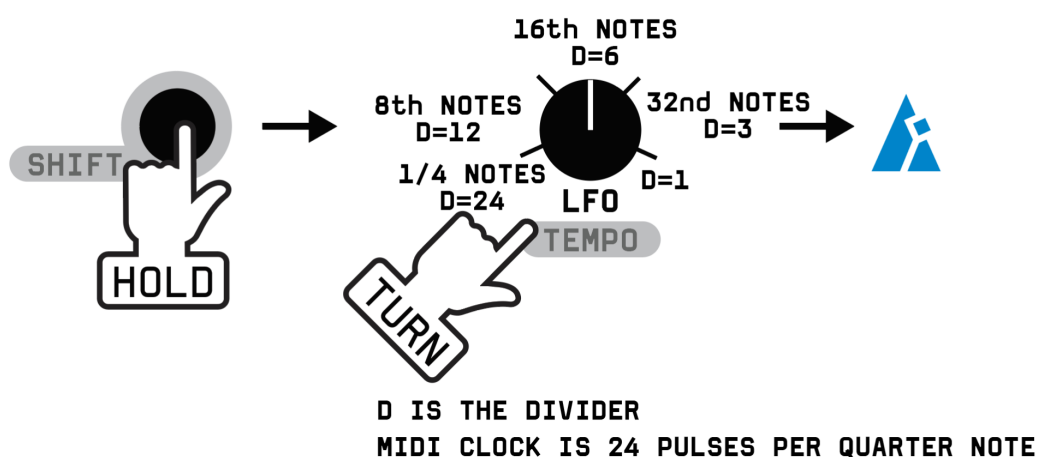
Citadel automatically syncs to the MIDI clock. If it is present, it will take the highest priority over the internal and external analog sync clock.

Note: When a clock is received using both USB and TRS MIDI, Citadel locks onto the first arriving MIDI source for the clock. When that clock becomes inactive, it switches to the other.

MIDI Clock

When the MIDI clock is active, TEMPO (SHIFT+LFO) selects the divider of the MIDI clock.

SET MIDI CLOCK DIVIDER



The pattern generator will render a step each:

- 24 MIDI clocks ($\frac{1}{4}$ note)
- 12 MIDI clocks (8th note)
- 6 MIDI clocks (16th note)
- 3 MIDI clocks (32nd note)
- 1 MIDI clock (1:1)

The Transport Controls behavior:

- **MIDI Start** resets the pattern generator to the first step and waits for the MIDI clock to start running. Resets the LFO when LFO is in sync mode.
- **MIDI Stop** resets the pattern generator and stops the sequencer (the MIDI clock may continue running in the background, but the pattern will

not run). The MIDI clock is still used to sync the LFO when present even after MIDI Stop.

- **MIDI Continue** starts running the pattern generator from its current position but does not reset it.

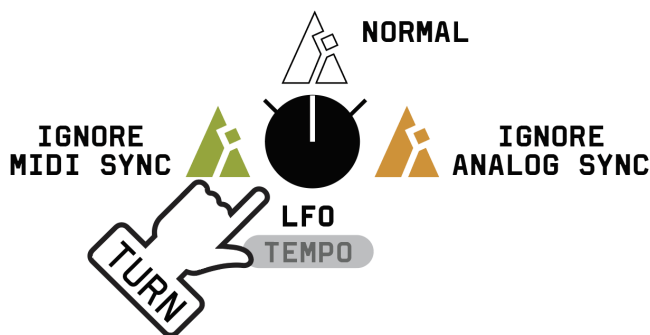
When holding **SHIFT**, the LFO light is **BLUE** to indicate that the MIDI clock sync is active.

You can set Citadel to **ignore** the MIDI Clock in the Advanced settings mode. Enter (or leave) the Advanced Settings mode by holding SHIFT and BANK for 2 seconds.

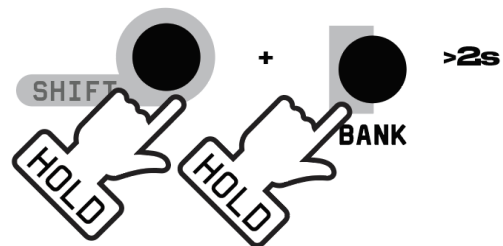
The LFO knob now offers 3 options for clock handling:

- Turn it **LEFT** to ignore the MIDI clock, indicated by **khaki** light.
- In the **CENTER** position, it follows the standard clock priority: MIDI clock over SYNC IN, over internal clock, indicated by **white** light.
- Turn it **RIGHT** to ignore analog SYNC IN, indicated by **orange** light.

SET INPUT CLOCK HANDLING



LEAVE ADVANCED SETTINGS



Sending MIDI sync (Real Time Messages) (only USB MIDI)

Citadel sends out MIDI clock and transport controls only if it is NOT receiving MIDI Clock. If MIDI Clock was received during a session, you'll need to stop sending it and restart the Citadel. Alternatively, you can activate the **Ignore MIDI Clock** feature in Advanced settings mode to resume sending MIDI Clock.

When using the **internal clock source**, the MIDI clock is always being sent. Resetting the pattern generator with the PATTERN R input will send both MIDI Stop and MIDI Start messages consecutively.

When **SYNC IN** is used as the clock source, Citadel will convert it to MIDI Clock. The conversion rate is based on the clock divider setting (TEMPO knob), and MIDI Clock messages are sent as if the pattern generator were advancing on every 16th note (this translates to 6 MIDI Clock ticks per pattern step).

If SYNC IN is inactive for more than 2 seconds (or twice the previous clock interval), the Citadel will send a MIDI Stop message and stop sending the MIDI Clock.

Once the external clock resumes, the Citadel will send a MIDI Start message and continue sending MIDI Clock.

Receiving MIDI Notes

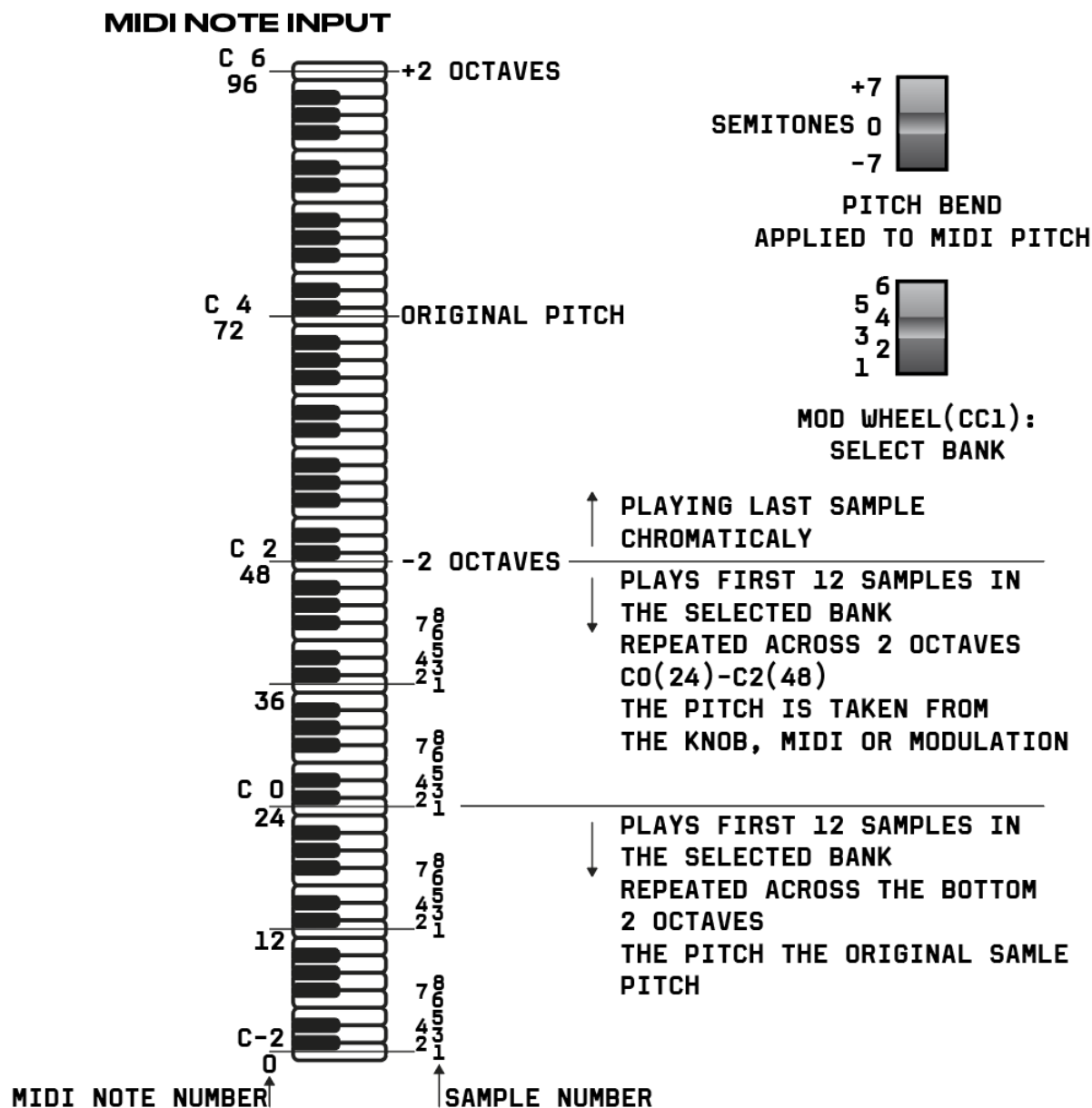
The Citadel reacts to MIDI Note On messages. Velocity information is not utilized. Note Off messages are ignored.

MIDI Notes in the lowest 4 octaves (0–48) will switch and trigger samples in the currently selected Bank. Within each of these octaves, the first sample is always aligned to note C. Only the first 12 samples in the Bank can be switched and triggered this way.

In the lowest two octaves (notes 0–23) the sample pitch will be set to the original pitch (as if triggering C4 note 72). In the two octaves above (notes 24–47) the pitch will not be changed and will either rest at MIDI Pitch or Patch Pitch (see further).

NOTE:

- **Sample switching** can be also done with **CC16**, while **Bank switching** is controlled by using the mod wheel on **CC1**. Using the mod wheel on a controller along with the SAMPLE knob is a great way to directly locate the desired sample. This separation is particularly useful for sequencing, as both parameters can operate independently.
- Notes above note 48 trigger the currently selected sample and adjust its pitch.
- The original pitch of the sample is MIDI note 72 (C4).



When using MIDI notes there will be two ways to calculate the pitch of the sample: **MIDI Pitch** and **Patch Pitch**.

The **MIDI Pitch** is turned on by a **Note On** message and kept until one of the following happens (then it switches back to Patch Pitch):

- change on Note input is detected
- adjusting Pitch knob
- adjusting the Scale (BANK+PITCH MOD)
- adjusting the Root of the Scale (BANK+SAMPLE MOD)

MIDI Pitch = MIDI Note Pitch + Free input + Fine tune + MIDI Pitch Bend

Patch Pitch = Note input + Free input + Fine tune + Scale root offset + Pitch knob

NOTE: When adjusting the PITCH knob, SCALE or ROOT via CC, the Citadel will also switch back to patch pitch.

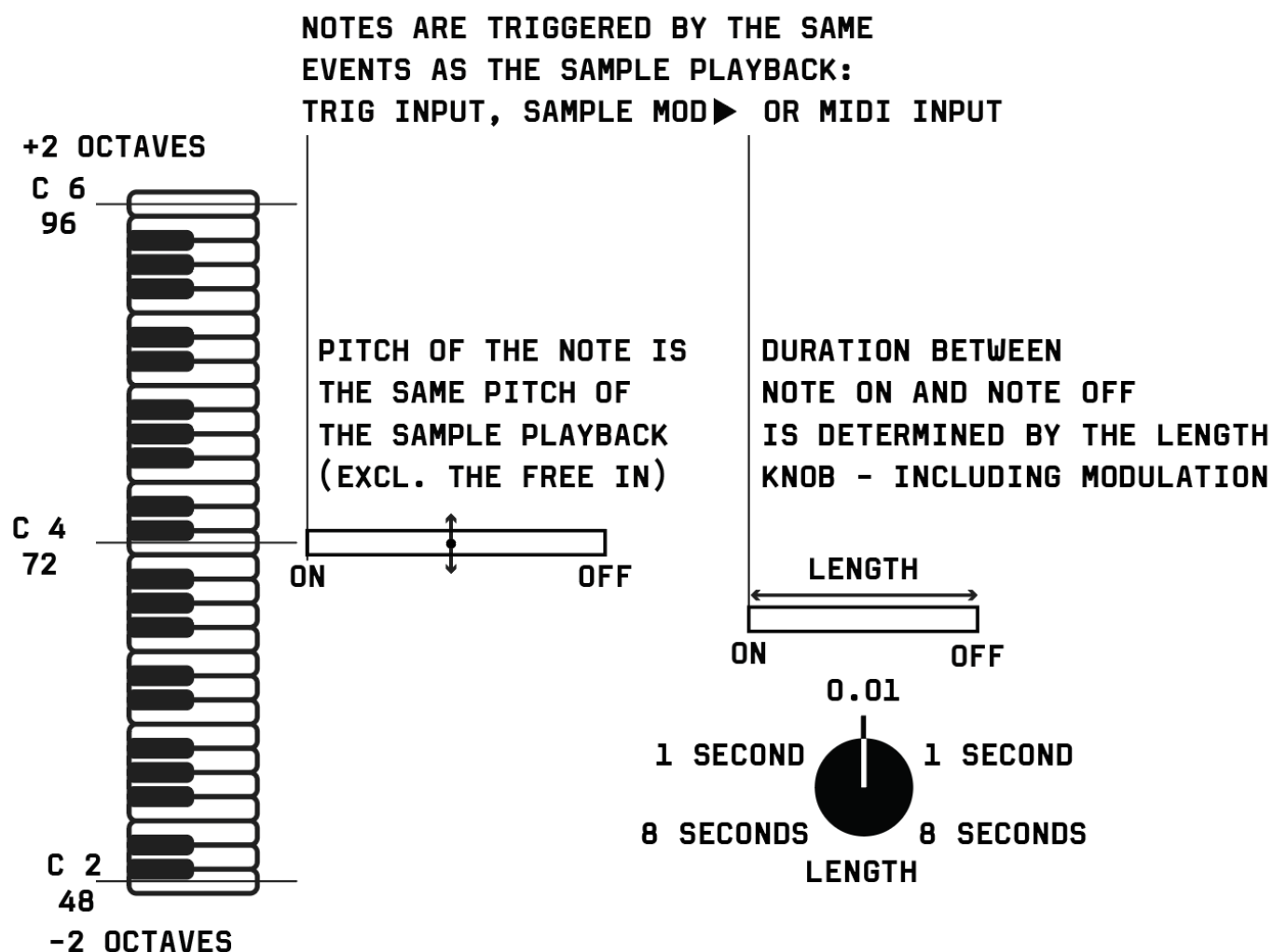
Sending MIDI Notes (only USB MIDI)

When a sample is triggered either by the TRIG input, SAMPLE MOD (play mode) or the MIDI input, the Note On message is sent with the same pitch information as the played sample.

With the exception of the FINE TUNE setting and the addition of PITCH FREE input (which is sent as Pitch Bend message).

MIDI Note Off is sent after the duration defined by the LENGTH knob has passed.

Note Off is also sent right before re-triggering another sample (if the previous sample hasn't finished yet).



Receiving Pitch Bend

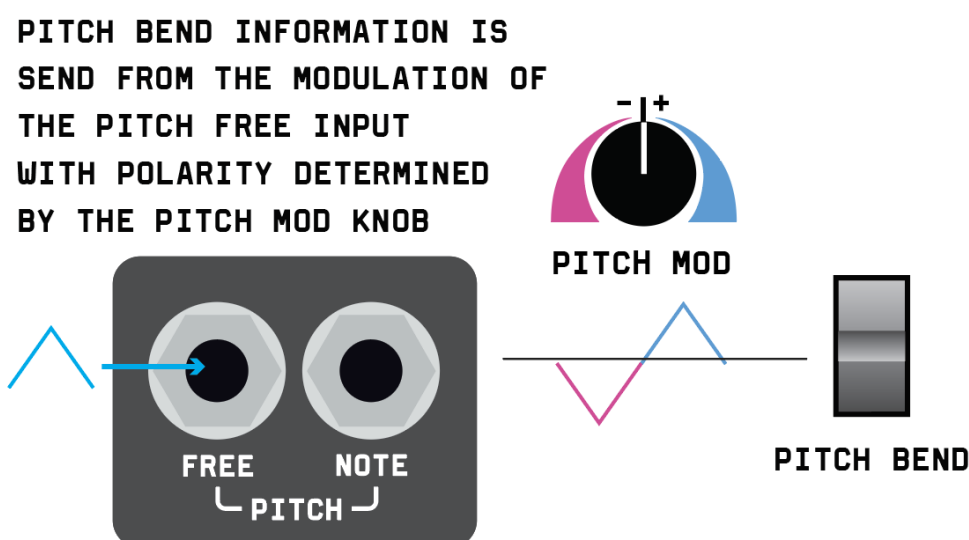
Receiving the Pitch Bend message adjusts the sample pitch continuously in the range of +/- 7 semitones.



NOTE: Pitch Bend message is applied only to MIDI Pitch which means you need to send some Note On message to be able to use Pitch Bend message. When modulating the Note input the Citadel will return to Patch Pitch and Pitch Bend will be disabled.

Sending Pitch Bend (only USB MIDI)

The FREE PITCH input continuously sends Pitch Bend information scaled and polarised with the PITCH MOD knob. If the knob is in the + range (right), it will bend up, while it will bend down if in the - range (left).



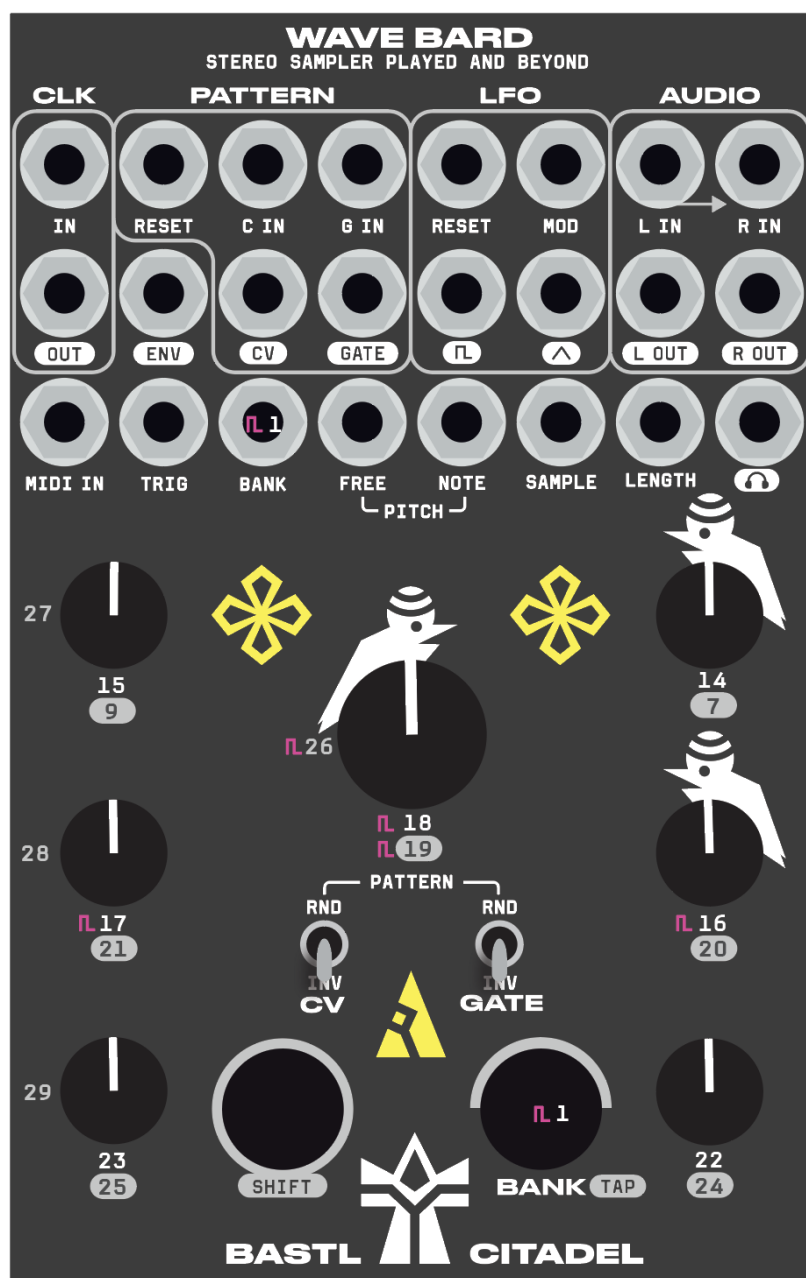
Receiving MIDI CC = Control Change / knob values

Any MIDI CC message contains three key pieces of information:

1. **MIDI Channel** – indicates which channel the message is sent on.
(See instructions on [setting MIDI channels](#).)
2. **CC Number** – Acts as the address of which knob or parameter is being controlled (e.g. CC16).
3. **Value** – Represents the position of the knob.

💡 When a CC message with the correct number is received, the corresponding knob is virtually adjusted to match the value—and it stays there until the physical knob is moved again.

INPUT CC NUMBERS FOR DIRECT PARAMETER SETTING



⌵ ON WAVE BARD THESE ARE UPDATED ONLY RIGHT BEFORE SAMPLE IS TRIGGERED

CC	Wave Bard	Note
1	BANK – updated only right before trigger or Note On	Maps 0–127 to 0–number of values
7	Output Volume	SHIFT + top right knob
9	Input Gain	SHIFT + top left knob
14	PITCH	Top right knob
15	PITCH MOD	Top left knob
16	SAMPLE – updated only right before trigger or Note On	Middle right knob
17	SAMPLE MOD – updated only right before trigger or Note On	Middle left knob
18	LENGTH – updated only right before trigger or Note On	Center knob
19	LENGTH MOD – updated only right before trigger or Note On	SHIFT + center knob
20	FILTER	SHIFT + middle right knob
21	FX	SHIFT + middle left knob
22	LFO	bottom right knob
23	LFO MOD	bottom left knob
24	TEMPO	SHIFT + bottom right knob
25	RHYTHM	SHIFT + bottom left knob
26	BANK MOD – updated only right before trigger or Note On	FX Mode/Bank + center knob
27	SCALE	Bank + top left knob
28	PITCH ROOT	Bank + middle left knob
29	FINE TUNE	Bank + bottom left knob
32	Humanize/Swing	Bank + bottom right knob
121	Reset all controllers	Goes back to knob control for values

Sending MIDI CC = Control Change (only USB MIDI)

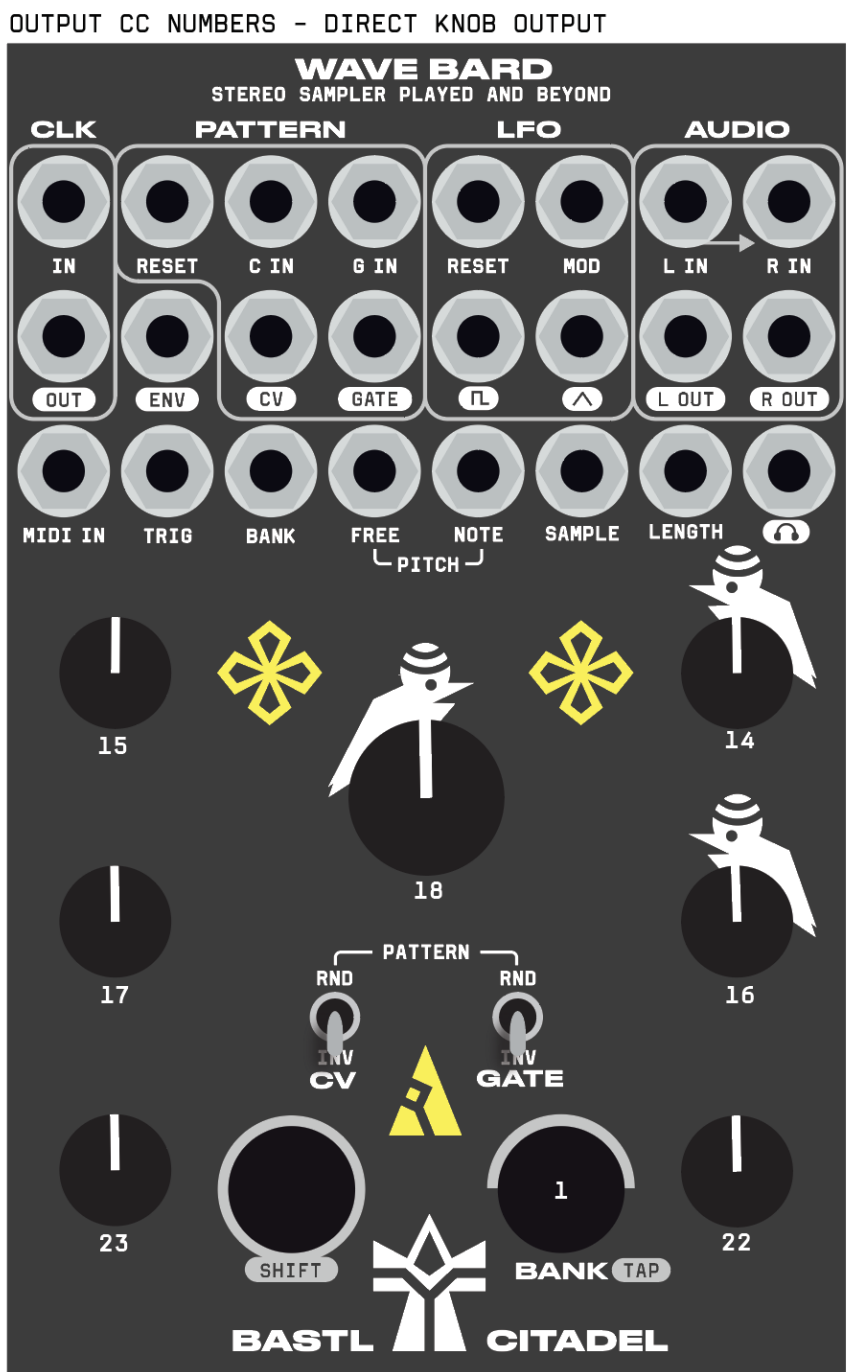
The knobs (when adjusted) send their values scaled to 0–127 on specific CC numbers.

On the Wave Bard some carefully considered modulations can be also forwarded to the MIDI stream in order to not overload it and make it easy to map in DAW.

CC messages are sent on the same MIDI channel as the incoming MIDI channel. See the [Setting the MIDI channel](#) section.

Mapping guide: To map the CCs sent by the knobs undo all patch cables first. After entering MIDI mapping (in your DAW) make sure to move only the desired knob.

CC1 is always sent when triggered. Patch only GATE or LFO to the TRIG input to map CC1.



CC	Wave Bard	Note
1	BANK + SAMPLE combination	Mapped to 0–127 always sent right before Note On/trigger. Not sent on manual trigger (short SHIFT press)
14	PITCH knob	Knob value (sent when knob moved)
15	PITCH MOD knob	Knob value (sent when knob moved)
16	SAMPLE knob	Knob value (sent when knob moved)
17	SAMPLE MOD knob	Knob value (sent when knob moved)
22	LFO knob	Knob value (sent when knob moved)
23	LFO MOD knob	Knob value (sent when knob moved)
30	Forward LENGTH	0–127 sent when knob moved in the forward range or right before Note On / trigger when modulation changed
31	Backward LENGTH	127–0 sent when knob moved in the backward range or right before Note On / trigger when modulation changed
32	BANK	Bank number mapped to 0–127 right before Note On / trigger when modulation changed. Also sent on manual Bank change.
33	SAMPLE	Sample number mapped to 0–127 sent continually if changed. Also sent on manual trigger (short SHIFT press)

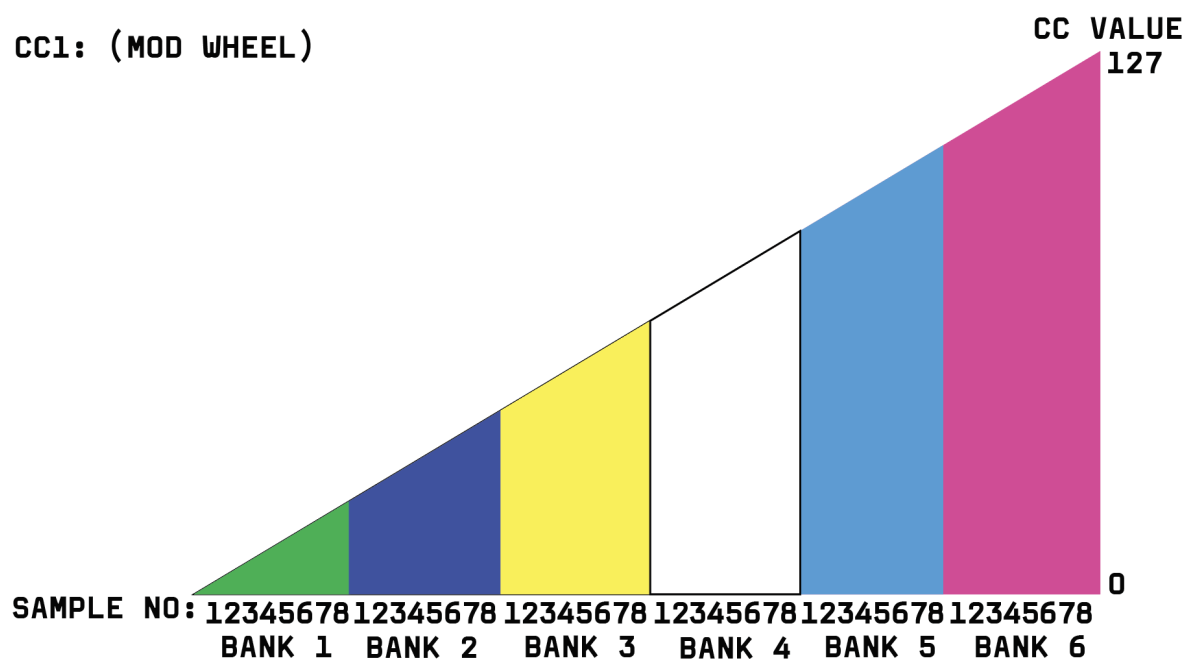
WAVE BARD SPECIFIC MIDI CC output (only USB MIDI)

In order to utilize the power of the sequencing on the Wave Bard there are few extra special CC messages sent.

CC1: (MOD WHEEL)

This combined value is useful for modulating sample selection zones in a multisampler or various other destinations.

It will take all samples in all banks and distribute them as shown on the picture and such value will be scaled to 0–127.



The CC1 value is calculated using the following equation:

CC value = scale 0–127[(number_of_samples_in_bank x bank_number) + sample number]

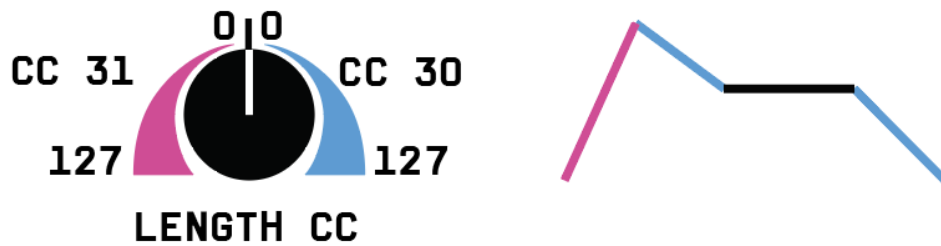
Mapping guide: CC1 is always sent when a sample is triggered. Unpatch all cables and patch only GATE or LFO to the TRIG input to send CC1.

LENGTH CC30 and CC31

Forward and backward direction of the LENGTH knob are sent as a separate CC number so you can map them for example to ATTACK and DECAY/RELEASE separately.

CC30 has value 0 in the middle and increases in the clock-wise direction. Counter-clock-wise direction does not send CC30.

CC31 has value 0 in the middle and increases in the counter-clock-wise direction. Clock-wise direction does not send CC31:



This CC value includes the LENGTH modulation combined with the LENGTH knob and is sent when the knob is adjusted or right before the sample is triggered when the input is modulated.

Mapping guide: Unpatch all cables and move the LENGTH knob either to forward or backward range. Start the mapping and move the knob slightly to map either forward CC30 or backward CC31.

Final Bank CC32

The bank number is scaled to 0–127 and is sent as CC32. This CC is only sent when manually changing the BANK or when BANK input is modulated it will be sent right before the sample is triggered.

Mapping guide: Unpatch all cables and manually change Bank by short pressing the BANK button.

NOTE: CC32 is NOT the BANK button sent as a direct physical control. The CC32 is only sent when BANK is changed which is excluding some interactions with the BANK button.

Final Sample CC33

This CC value includes the modulation thru the SAMPLE MOD knob combined with the SAMPLE knob and is sent continually when the combined value changes, or when sample is triggered manually with short press of the SHIFT button.

Mapping guide: Unpatch all cables and manually trigger the sample by short pressing the SHIFT button.

MEMORY RESET

Press and hold the **SHIFT** and **BANK** buttons for over **10 seconds** to perform a memory reset. This will restore all settings to their default values, including tempo, volume settings, input behavior etc.

FIRMWARE UPDATE

- 1) Disconnect Citadel from your Eurorack power!
- 2) Use a **USB-C cable** to connect your **Wave Bard** to your computer while holding the SHIFT button.
- 3) The **Wave Bard** will boot into **Update Mode** (no sound will play).
- 4) Copy the **.uf2 file** to the **RPI-RP2 disk** that appears on your computer.

Check Firmware Version

- 1) **Boot into Test Mode:** Hold the **BANK** button and turn the power **ON**.
- 2) **Listen to the Headphone Output directly:** The **Wave Bard** will announce the firmware version via its voice output.
- 3) Turn power OFF and ON to leave the test mode

APPENDIX

Test Mode

In order to test the hardware, the Wave Bard includes an integrated test mode.

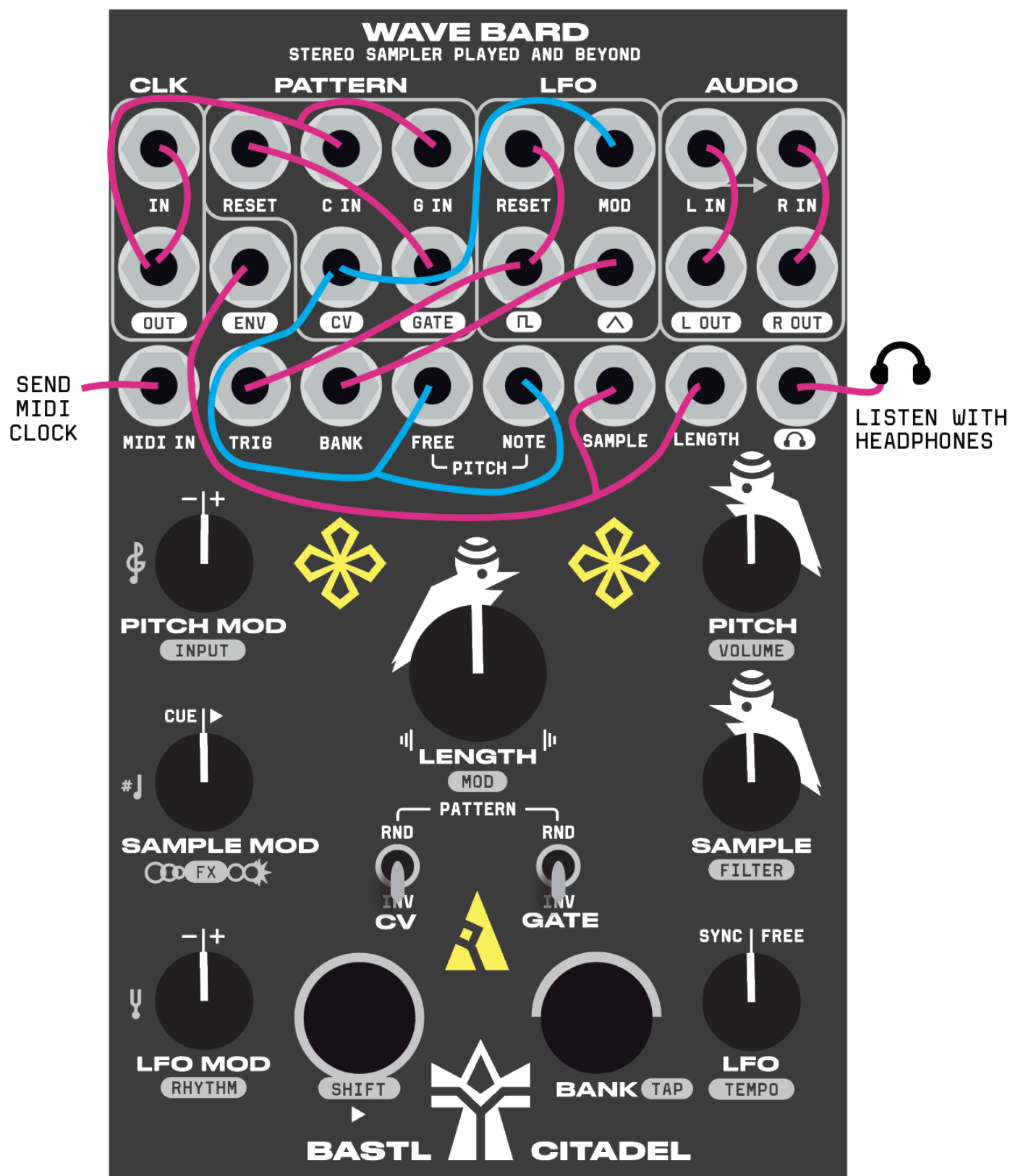
Hold **BANK** and turn power ON to enter the test mode. Listen to the headphones output: the Wave Bard will announce the firmware version via its voice output.

To perform the full HW test do the following:

1. Turn the power in your eurorack system **OFF**
2. Patch the following connections with patch cables (use stack-cable or passive multiple to split signals):
 - a. L OUT to L IN
 - b. R OUT to R IN
 - c. LFO PULSE to LFO RESET
 - d. LFO PULSE to TRIG
 - e. CLK OUT to CLK IN
 - f. CLK OUT to PATTERN "G"
 - g. CLK OUT to PATTERN "C"
 - h. ENV to SAMPLE MOD
 - i. ENV to LENGTH MOD
 - j. CV to FREE PITCH MOD
 - k. CV to NOTE PITCH MOD
 - l. CV to LFO MOD
 - m. LFO TRI to BANK IN
 - n. GATE to PATTERN "R"
3. Connect headphones to the headphones output and listen to them
4. Hold **BANK** and turn the power of the eurorack system **ON**.
5. The Wave Bard will announce the introduction.
6. LEDs will light **red** and automatic testing will start. Each successful test is signaled by a **ding sound**.
7. All automated tests should **pass** and LEDs turn **blue**.
8. Turn all the knobs all the way left and all the way right.
9. Press both buttons.
10. Send MIDI Clock to the MIDI Input

11. The test should be complete and indicated by green lights, and the Wave Bard announcing “Test Success”.

TO SPLIT SIGNALS USE STACK-CABLES OR PASSIVE MULTIPLE



Manual final tests

Since the automated test cannot test Toggle switches and Jack Detection on Audio Input, they need to be tested manually.

12. Keep the module ON after "Test Success" and unplug all the jacks.
13. Now test the audio inputs – the metronome light should glow green if the left or the right jack are plugged in. Test each separately.
14. Then test the toggle switches. Their state is signalised at the top two lights with the following colors:
down = red, center = blue, up = green.

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The idea turned into reality
thanks to everyone at Bastl Instruments
and thanks to the immense support
of our fans.

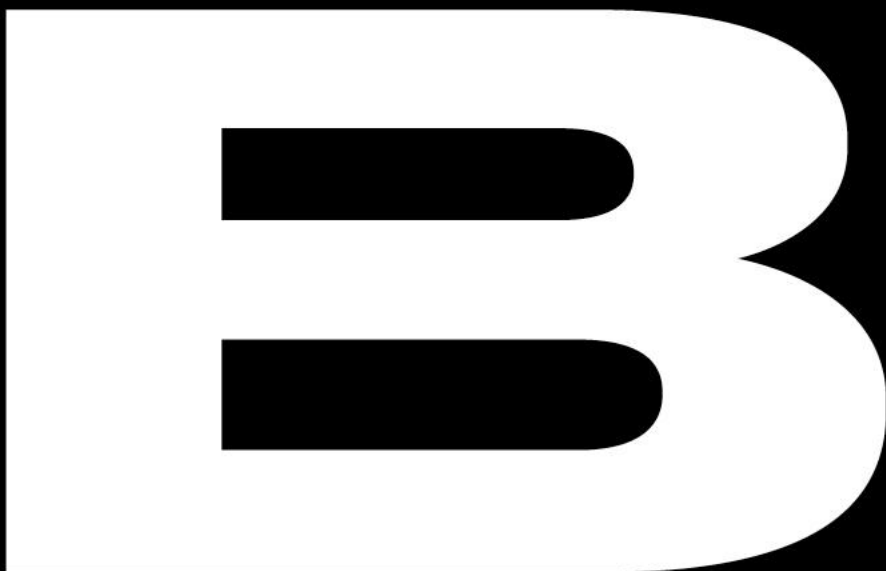


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ON YOUR SONIC ADVENTURES!**