# FX WIZARD

# BASTL INSTRUMENTS
# KASTLE 2

# KASTLE 2 FX WIZARD

The Kastle 2 FX WIZARD is a compact, patchable stereo multi-effects unit that empowers you to explore the limits of sound processing through modulation and modularity. Use simple yet refined stereo effects, or go nuts with modulation and immerse in a powerful glitch and sound design heaven. Instead of navigating thru preset effects, you can craft your own unique effects with dynamic behavior using modulation. The FX WIZARD embraces happy accidents, sparking excitement with unexpected and unheard sonic transformations.

There are three main categories of effects, each offering both finely controlled parameters and exciting extremes that you wouldn't typically find elsewhere:

- DELAY FX family (blue/green): Includes a clean stereo delay, a flanger with stereo chorus capabilities and some spicy extremes, and a freezer to capture and hold moments of time in a fun modular way.
- AMPLITUDE FX family (bright colors): Features an autopanner with ring modulation possibilities, a crunchy digital crusher with powerful feedback, and a rhythmic slicer that can create dynamic transients from any drone.
- PITCH-SHIFTING FX family (red colors): Contains a dirty pitcher that shifts signals up in either tonal or rhythmic patterns, a fun replayer effect that reverses audio and introduces lots of pitch-shifting artifacts, and last but not least, a nuanced shifter that adjusts the pitch up or down to achieve detuned sounds and feedback pitch slopes.

Effect parameters can be modulated using the built-in LFO or a surprisingly powerful pattern generator. For dynamic effects that respond to incoming audio (hello, ducking), there's also an envelope follower.

Each effect can widen the STEREO field by detuning some of its core, while the FILTER allows you to brighten or darken the sound. All effects react to triggers or clocks in both predictable and exciting ways.

With modulation and the right FX MODE, the gates to extreme sound design and glitch territory open wide.

# Features

- 9 FX modes
  - delay (max time in stereo is 1.15s – with FW update v1.1)
  - flanger
  - freezer
  - panner
  - crusher
  - slicer
  - pitcher
  - replayer
  - shifter
- Stereo audio processing at 44kHz/16-bits
- Time parameter with attenuverting modulation (S&H or free)
- Feedback parameter with attenuverting modulation
- AMOUNT mix with attenuverting modulation
- FILTER in the feedback with Lowpass/Highpass
- STEREO detuning for each FX MODE
- FX MODE cv input with attenuation to change modes with CV
- TRIG input to synchronize effects with tempo
- LFO with triangle and pulse output, reset input, attenuverting modulation, synced or free
- Tempo generator with tap tempo and divider with external clock
- Pattern generator (tempo synced) with GATE and CV output and patch programmability
- patchable envelope follower
- stereo input with input gain (up to +12db), accepts up to 6 Vpp signal
- stereo output capable of driving headphones up to 250 Ohm
- analog sync input
- analog sync output
- USB-C (firmware updates, power)
- 3x AA battery power (both rechargeable and non)
- Power consumption approx. 100-150 mA, should last up to 15-18 hours on 3xAA batteries.

# Introduction

For starters, let me tell you just one thing: **Follow the white rabbit!**
The knobs with rabbits control the main parameters of your sound. All other knobs come alive once you start patching.
The Kastle 2 FX WIZARD can be experienced in various ways. It is absolutely legit to just explore and let your ears guide you. If that's your style, you might appreciate the Quick Start guide.

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

The following complete manual will give you a deeper understanding of how everything works, helping you achieve the exact results you want. It's packed with tips to show you just how deep the rabbit hole goes... so buckle up!

## Shift

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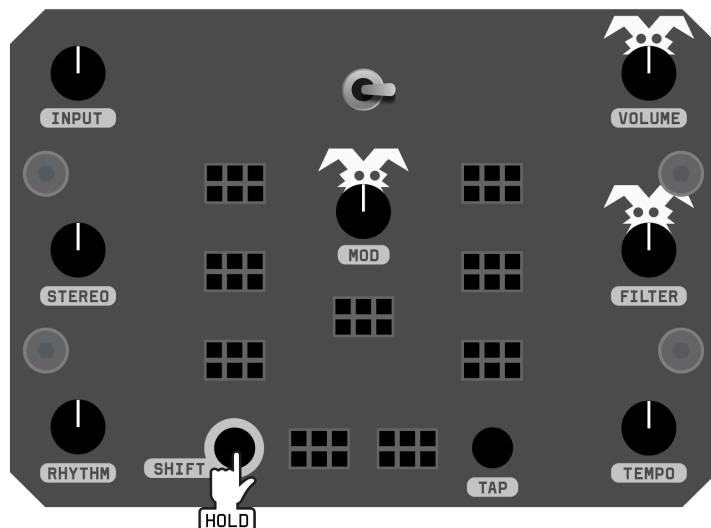


## Button Combos

SHIFT + KNOB = secondary function in silver
SHIFT + FX MODE = Tap tempo
FX MODE = next FX mode
FX MODE + SHIFT = previous FX mode
FX MODE + AMOUNT = modulation attenuation for FX MODE input

SHIFT + FX MODE >5s = enter/leave ADVANCED SETTINGS (input behavior etc.)
SHIFT + FX MODE >15s = MEMORY RESET
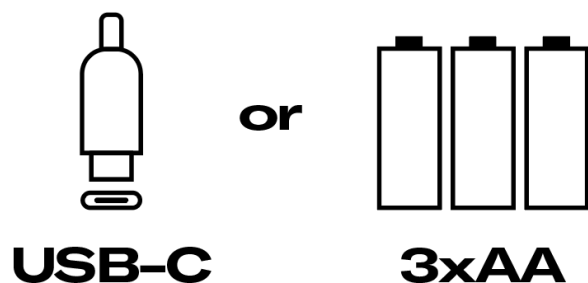
## Connecting KASTLE 2

SHIFT + TIME MOD knob = set input gain
SHIFT + TIME knob = set output volume
SHIFT + FX MODE >5s = ADVANCED SETTINGS (input behavior etc.)

## *Power*

Kastle 2 can be powered by USB-C (5V) or 3x AA batteries—either rechargeable or non-rechargeable.



**USB-C**   or   **3xAA**

**Low battery levels** will cause the backlight colors to turn red.
Colors and sound should still function properly down to about 3V. Power voltage levels below 3V indicate dead batteries.
Fresh non-rechargeable alkaline batteries:  3x1.5V=4.5V
Fully charged NiMh 3x1.2V=3.6V

To turn ON the device, move the Power switch to the right position. Push it to the left position to turn it OFF.



Depending on your power source the maximum output voltage of the output patch points might change. With rechargeable batteries it might only read 3.6 volts (3x1.2V) or lower when drained. With USB-C the output voltage will almost reach 5 volts (around 4.8V).

**Note:** Kastle 2 does not charge or draw power from your batteries when connected via the USB port.
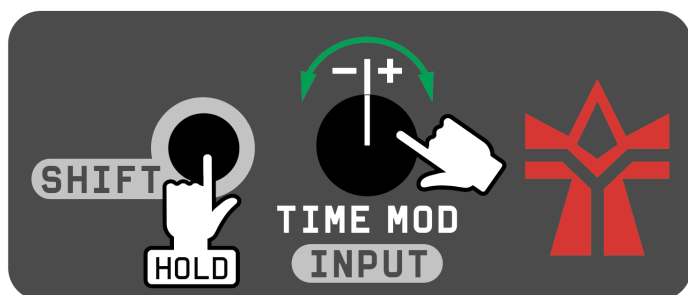
## USB
The USB port is used for power and firmware updates.

## *Audio*



Connect your sound source to the **AUDIO IN** jack.

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



While holding the SHIFT button the signal strength is indicated by the light in the word KASTLE and when it reaches RED it is clipping at the input and you should lower your input gain. Keep the input gain so the signal is peaking into orange.

The light glows RED when clipping also when not holding SHIFT.

For the **best quality** set the output volume of your audio source to the maximum (if using line-level or headphone output) and adjust the input gain.

**Note:** When connecting an audio signal higher than 6 Vpp (eg. from Eurorack), the clipping might not be shown (because it already clips on the analog input before it reaches the digital codec). If you want to use a higher signal than 6 Vpp, you need to attenuate it first externally.

Connect the output of Kastle either to headphones or further devices that receive line level audio to the **AUDIO OUT** jack.
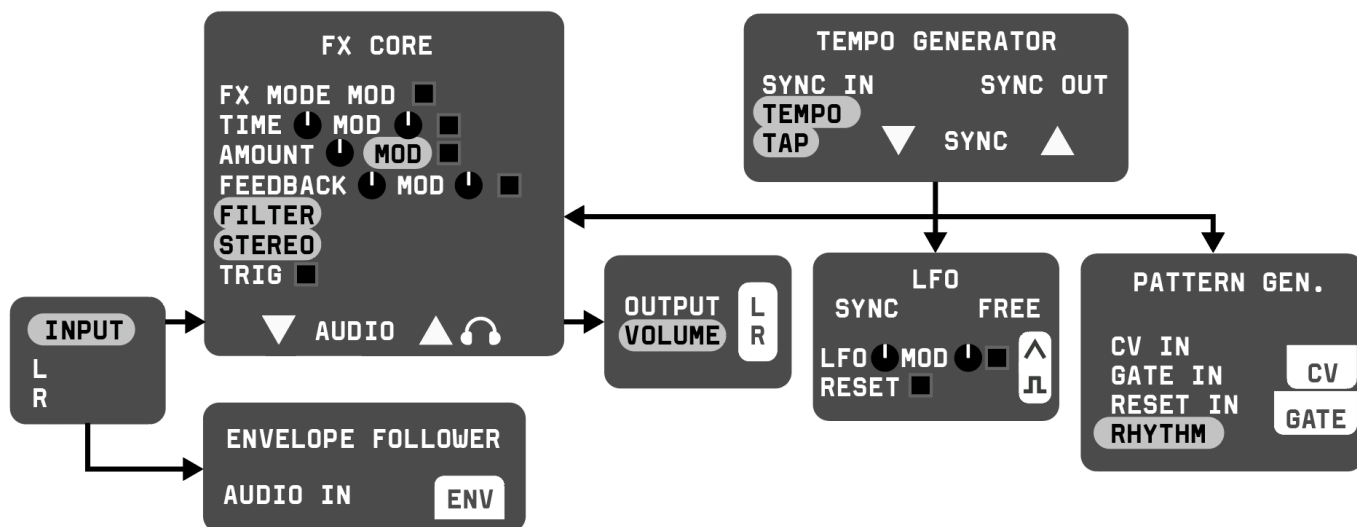
To set the output **VOLUME** hold SHIFT and turn the TIME knob.



## Dungeon map

This diagram shows the building blocks of the Kastle 2 FX Wizard and where each control belongs.
Each section has a dedicated chapter in the manual.



## FX Core

Shortly press FX MODE to cycle through the effects.

Each FX MODE has a color attached and has 3 main parameters - knobs with the white rabbit - that can be modulated: TIME, FEEDBACK and AMOUNT and two more hidden parameters: FILTER and the STEREO widening. There is also TRIG input for aligning the effects with tempo or triggering them rhythmically.

## Main sound controls

These are the main controls that affect the sound:
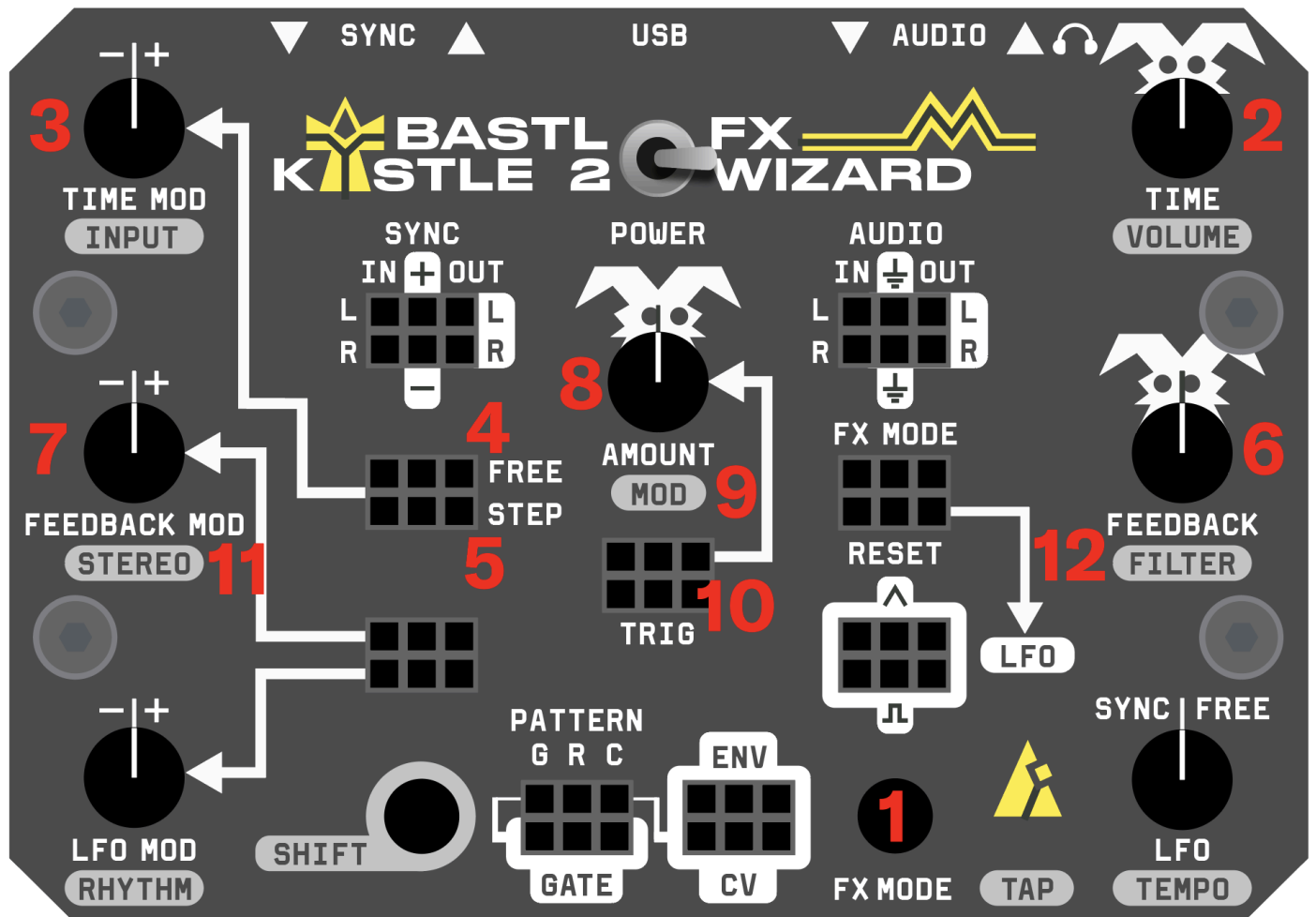


1. **FX MODE** changes the mode/effect and all other parameters change function slightly based on the mode. Bellow all the modes are listed with specific details
2. **TIME** sets the main time parameter for each effect - often perceived speed or repetition rate or as frequency.
3. **TIME MOD** knob sets how much modulation from the TIME MOD patch points (white arrow towards the knob) is being applied to the TIME parameter. In the middle of the knob there is no modulation. To

the right the modulation modulates in positive way and to the left it modulates in negative way.

4. The **FREE** TIME MOD patch point modulates the TIME parameter real time.

5. The **STEP** TIME MOD patch point modulates the TIME parameter only with tempo clock creating stepped modulation as if you were using sample & hold.

6. **FEEDBACK** is the unique parameter here - it interacts with the input signal and creates an organic feedback tone that also interacts with the effect itself. The loudness of your incoming audio matters so you can shape the feedback responsiveness or dominance by adjusting your input gain.

7. **FEEDBACK MOD** knob sets how much modulation from the FEEDBACK MOD patch point (white arrow towards the knob) is being applied to the FEEDBACK parameter. In the middle of the knob there is no modulation. To the right the modulation modulates in positive way and to the left it modulates in negative way.

8. **AMOUNT** - is typically how much effect is applied. Fully left this knob turns off any effect and you should hear a clean signal.

9. **AMOUNT MOD** input modulates the AMOUNT knob. To set how much it is being modulated hold SHIFT and turn the AMOUNT knob. In the middle of the knob there is no modulation. To the right the modulation modulates in positive way and to the left it modulates in negative way.

10. **TRIG** input is to align the effect better to the tempo.

## STEREO

11. You can get a radical **STEREO** image by detuning the main TIME parameter.
Hold SHIFT + FEEDBACK MOD knob = STEREO detune of the TIME parameter

# FILTER

12. There is also a **FILTER** to make your effects darker or brighter. The FILTER is in the feedback path and interacts with the feedback tone and the effect itself.
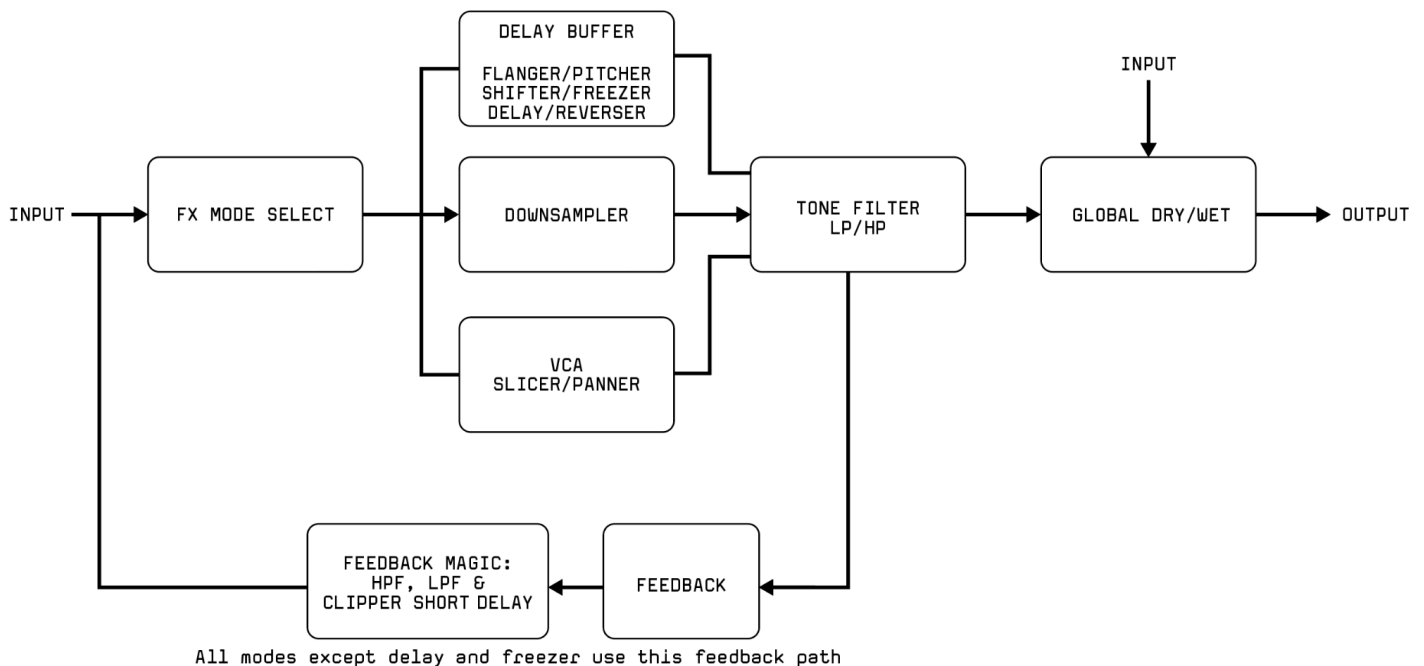Hold SHIFT+ FEEDBACK knob = FILTER
In the middle the filter is open, to the left it acts as a lowpass filter and to the right it becomes a highpass filter.
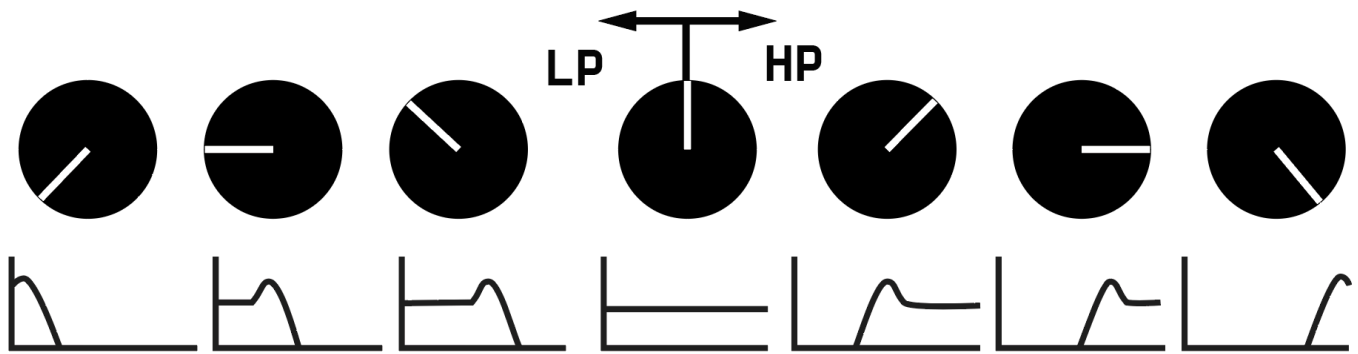


# Signal flow

Here is the block diagram of the FX Core of Kastle 2 FX WIZARD

# FX MODEs

To change the next **FX MODE** press the FX MODE button. The color on top of Kastle 2 will change to indicate the mode.
To go back to the **previous** FX MODE hold the FX MODE button and press the SHIFT button.

You can also change the FX MODE automatically by modulating the FX MODE patch point. The FX MODE change via the patch point will always be quantized to a tempo. If the FX MODE modulation doesn't work, make sure you have a tempo running.
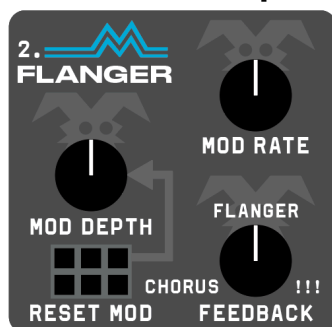
Hold FX MODE and turn the AMOUNT knob to set attenuation of the FX MODE input.
Tip: use the attenuation to switch between two specific effects with GATE or LFO PULSE. Or use for different mode selection when modulating with CV.

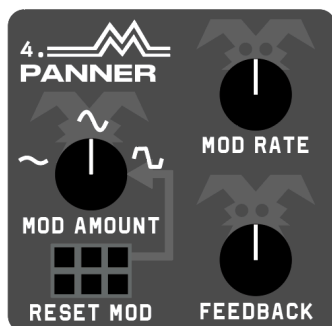**Press** FX MODE = **next mode.**          **Hold** FX MODE + **press** (SHIFT) = **previous mode.**

**1. DELAY**
DELAY TIME
DRY/WET
SYNC TIME    FEEDBACK
The echo sound full of life.

**2. FLANGER**
MOD RATE
MOD DEPTH    FLANGER
CHORUS    !!!
RESET MOD    FEEDBACK
Add movement by detuning.

**3. FREEZER**
SYNCED TONAL
FREEZE    FREEZE RATE
ADD NEW AUDIO MORE DENSE
REC
DRY/WET
NEW FREEZE    FEEDBACK
Freeze bits of incoming sound.

**4. PANNER**
MOD RATE
MOD AMOUNT
RESET MOD    FEEDBACK
Move left/right & move around.
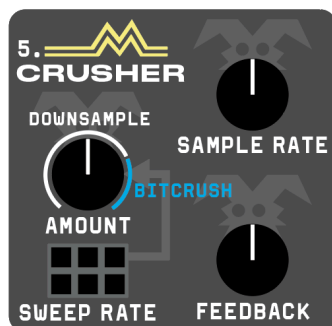
**5. CRUSHER**
DOWNSAMPLE    SAMPLE RATE
BITCRUSH
AMOUNT
SWEEP RATE    FEEDBACK
Digital bits & steps destroyer.

**6. SLICER**
PATTERN
ADD RANDOMNESS
ENV DECAY
ENV TRIG    FEEDBACK
Cut out small transients.

**7. PITCHER**
RHYTHM TONAL
SHIFT UP    SHIFTING WINDOW
AMOUNT
RESET MOD    FEEDBACK
Pitch up & speed up. More!
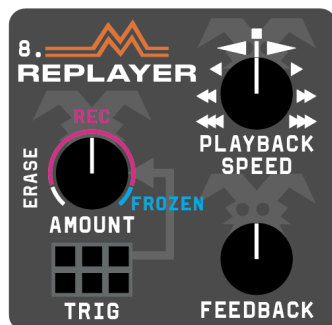
**8. REPLAYER**
REC    PLAYBACK SPEED
ERASE    FROZEN
AMOUNT
TRIG    FEEDBACK
Forward/backward play/replay.

**9. SHIFTER**
DOWN    UP
SHIFT
DRY/WET
TRIG    FEEDBACK
Shift pitch up or down. A lot!

# DELAY (GREEN)

Creates classic delay effect and plenty other effects based on a delay (see patch tips).

TIME knob sets the delay time from longest to the left (1.15s) to shortest (2ms) to the right AMOUNT knob controls the mix between the original and delayed signal.

FEEDBACK increases the number of repeats and the length of the echo. Due to implementation limits it uses feedback before FILTER.

STEREO - detunes delay time for left and right channel

TRIG - can be fed by a clock signal (eg. from SYNC OUT on SYNC IN) to sync the delay time - when detected the TIME knob snaps to the closest time division/multiplication of the arriving clock and the mode lights dip in brightness to indicate sync.

The divisions/multiplications for synced delay are as follows: 1/256, 1/128, 1/64, 1/32, 1/16, 1/12, ⅛, ⅙, ¼,⅓. 2/3, ½. 1, 2, 3/2, 3, 4, 6, 8, 12, 16, 32 . However they can only reach delay times between the longest (1.15s) and shortest (2ms) delay time.
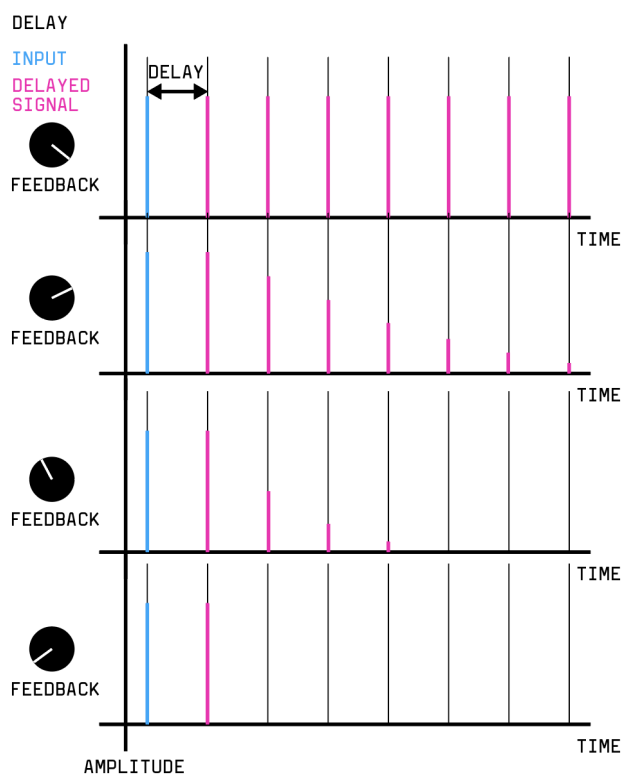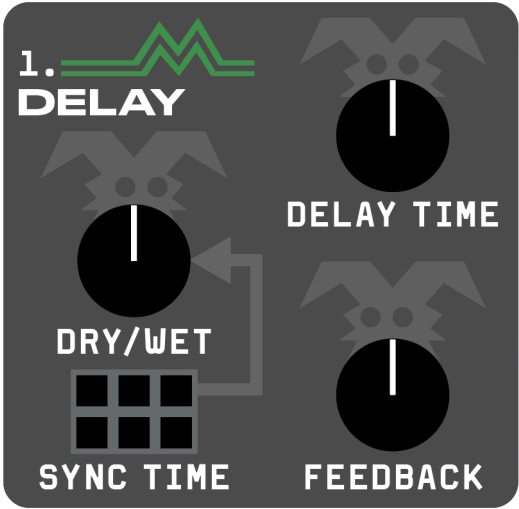
# FLANGER (CYAN)

Flanger mode animates your sound in subtle or more intense ways creating chorus effect with AMOUNT in the middle and flanger effect with FEEDBACK applier.
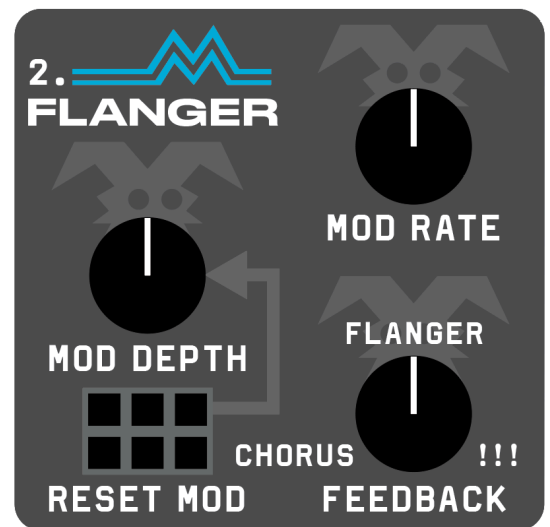
TIME knob sets the modulating frequency
AMOUNT knob sets the amount of ramp modulation of the delay time - increasing the pitch shift and controls local and global dry/wet amounts.
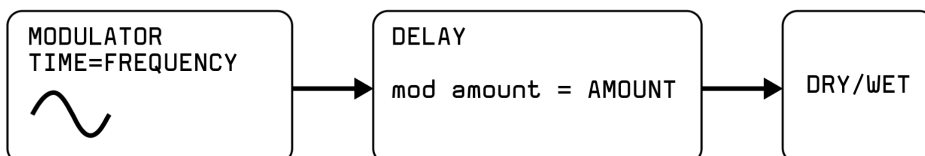FEEDBACK is global feedback
STEREO - detunes the modulating frequency for left and right channel
TRIG - resets the modulator

It works by sine wave modulating delay time resulting in slight pitch modulation.

FLANGER

# FREEZER (BLUE)

Uses the delay buffer to freeze a chunk of audio after it has been activated. With longer times it is synced to tempo creating rhythmic repeats, with faster times it becomes tonal and freezes timbral components of incoming signal.

There are 3 ways of how you can freeze a new chunk of incoming audio :
1) you enter the freeze mode (either by browsing with the FX MODE button or by modulating the FX MODE input)
2) You transition from zero AMOUNT to non-zero AMOUNT
3) you trigger the TRIG input

TIME knob sets the repeat time - to the left it becomes tempo divisions for rhythmical freezes and to the right it becomes tonal.
AMOUNT knob controls local and global dry/wet amounts and freezes new audio when leaving the minimum setting
FEEDBACK feeds some more incoming audio into the frozen buffer to increase its density (does not use the main feedback path)
STEREO - detunes the  left and right channel repeat/freeze time
TRIG - freeze new chunk of incoming audio

# PANNER (WHITE)

Modulates amplitude of the signal in inverse phase for left and right channel therefore creates panning of the signal from left to right.
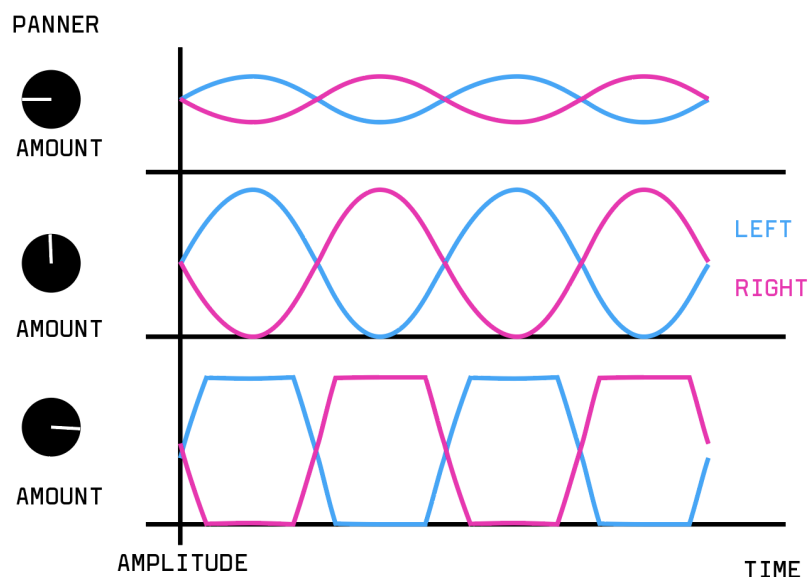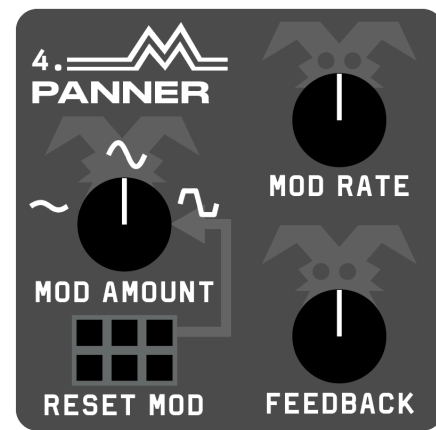
TIME knob sets the panning frequency - goes up to audio rate creating stereo ring mod effect.

AMOUNT knob sets the amount of the amplitude modulation - clipping the sinewave into a squarewave for more radical panning.

FEEDBACK is global feedback

STEREO - detunes the left and right channel panning frequency

TRIG - resets panning modulator

# CRUSHER (YELLOW)



Introduces downsampling effect and manipulates bits to achieve rich bitcrushing.

TIME knob sets the downsampling frequency

AMOUNT knob sets the intensifying of downsampling effect and adds XOR bitcrushing towards the right
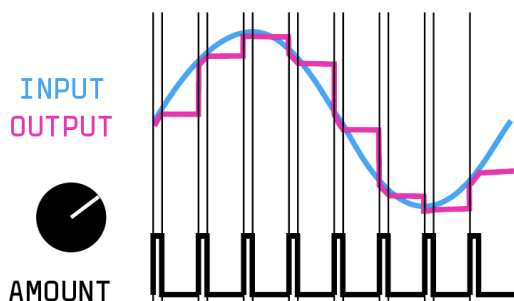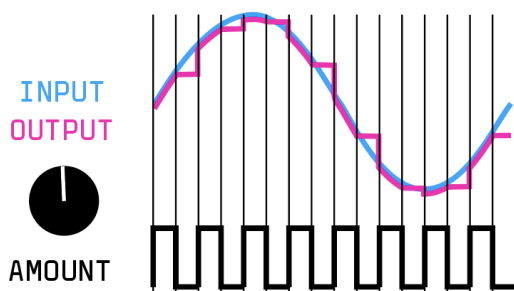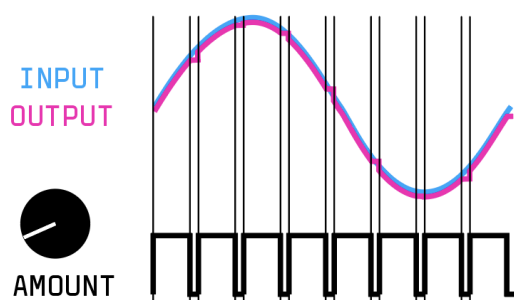
FEEDBACK is a global feedback adding distorted tonal backdrop

STEREO - detunes the left and right channel downsampling frequency
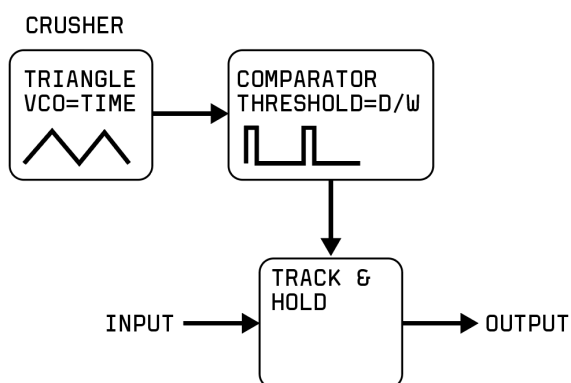
TRIG - triggers envelope that dips the downsampling frequency temporarily
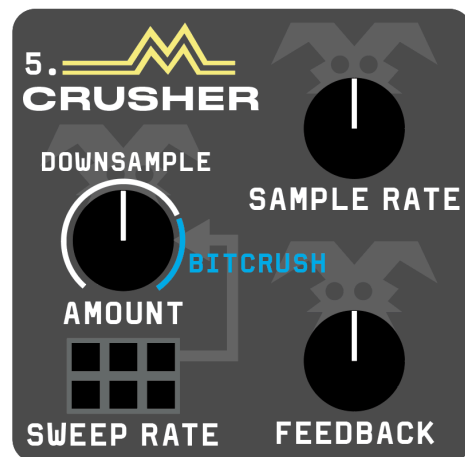
CRUSHER
TIME=DOWNSAMPLE FREQUENCY



ADDS XOR BITCRUSH

# SLICER (LIGHT GREEN)

Slicer effect with rhythmical chops.
Internal rhythm sequencer (synced to tempo) triggers slicing decay envelope modulating the amplitude of the signal.

TIME knob sets the trigger pattern for the slicing envelope

AMOUNT knob sets the DECAY of the envelope (long to the left, short to the right) and controls local and global dry/wet mix.
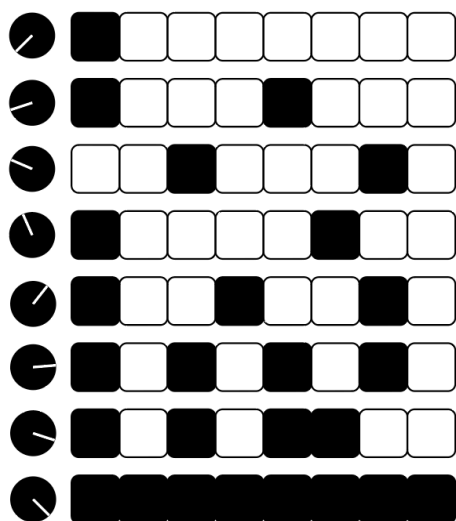
FEEDBACK adds probability of randomly inverting triggers adding randomness to the pattern and adds global feedback

STEREO - sets a different pattern for left and right channel

TRIG - triggers the slicing envelope
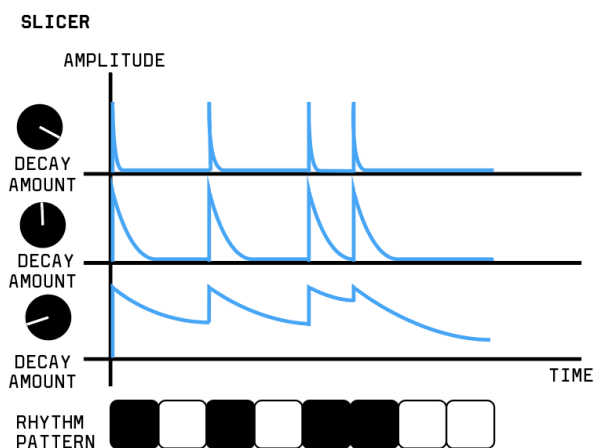
# PITCHER (RED)

RAMP modulation or delay buffer to achieve crude pitch-up shifting effect, with rhythmical chops with slow TIME and formant shifts with faster TIME

TIME knob sets the size of the shifting window. Can be seen as modulation speed or grain size.
AMOUNT knob sets the amount of ramp modulation of the delay time - increasing the pitch shift and controls the dry/wet mix.
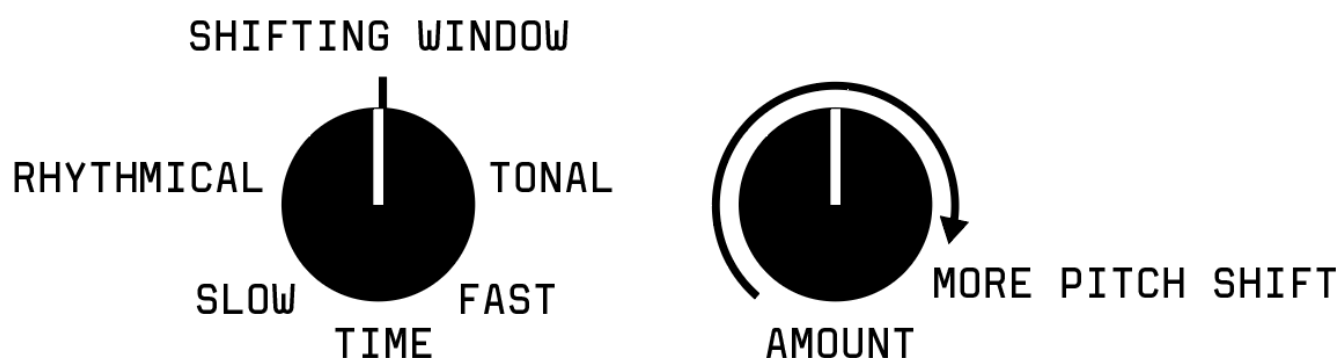FEEDBACK is global feedback
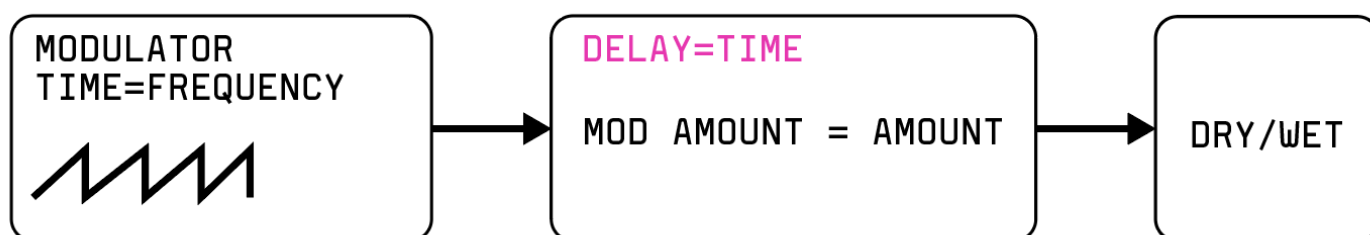STEREO - detunes the modulating frequency for left and right channel
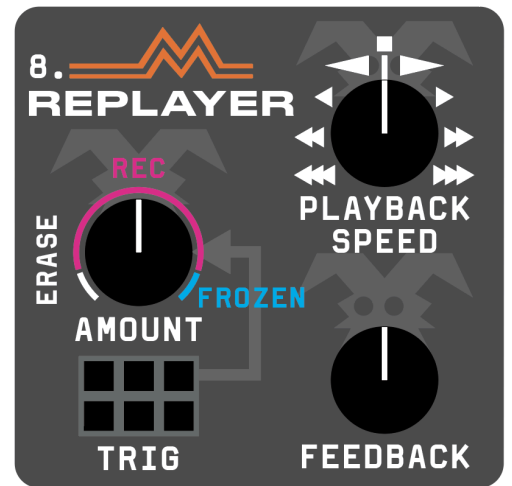TRIG - triggers envelope that temporarily enlarges the shifting window

PITCHER



PITCHER

# REPLAYER (ORANGE)

Tape looper emulation.

TIME knob sets how fast and in which direction the "tape" runs. To the left it runs backwards, to the right it runs forwards. This is for both recording and playback.

AMOUNT knob controls both the output and
the buffer input - turn it all the way right to lock the buffer completely, going more dry allows more signal to be recorded and added to the already existing audio in the buffer. The knob position determines the volume of new signal and the existing signal (all the way dry makes the existing audio go away completely)
FEEDBACK - the global feedback but only for the incoming new signal, not the output
STEREO - detunes tape loop speeds for each channel
TRIG - fills the entire buffer with new new audio
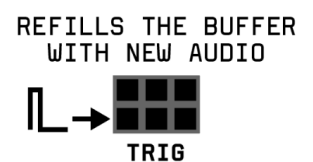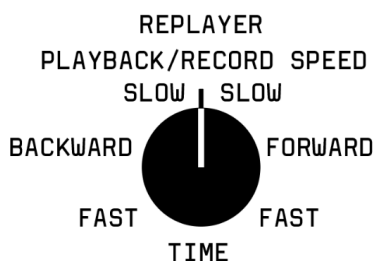
# SHIFTER (PINK)

Different approach to pitch shifting than the pitcher that avoids the "transient duplication".

TIME knob controls how the pitch changes, above middle is higher, below middle is lower
AMOUNT knob controls the global dry wet
FEEDBACK - controls the global feedback (makes cool noises when the pitch shift is just slight and the input signal goes away)
STEREO - changes the pitch shift amount for each channel
TRIG - briefly resets the stereo effect by syncing the controlling lfos

# Patchbay

Patchbay of Kastle 2 is made of patch points which are in most cases triple patchpoints meaning the horizontal 3 points are connected together. The exceptions to that rule are the AUDIO and SYNC labeled connectivity patch points and the PATTERN GENERATOR where each of the patch points serves a different purpose.
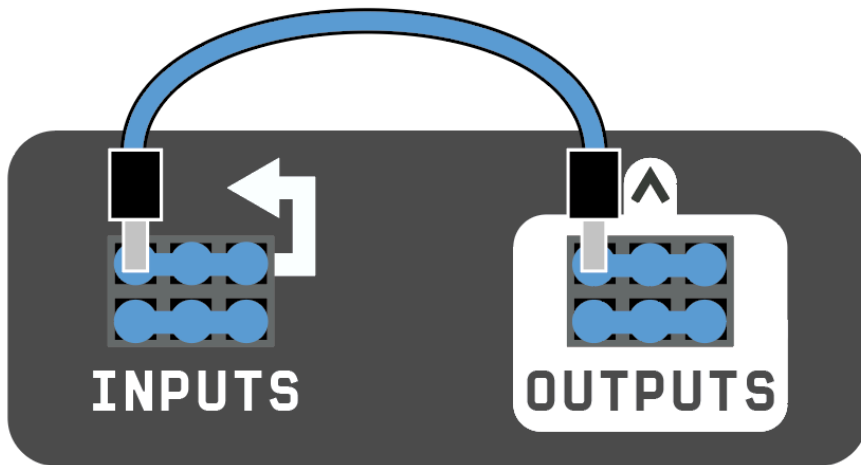


The **Outputs** have **white outline** and are labeled inside the white outline.
The **Inputs** do not have white outline and are labeled with labels in **white text** or by **white arrows** pointing towards respective modulation destinations.
The patch points are 0-5 volt compatible meaning the inputs take voltages between 0 and 5 volts and the outputs can go from 0 up to 5 volts or less-depending on the power source.

Typically you connect **Outputs** to **Inputs** but you can also connect several **Outputs** to one **Input** etc. Do not worry nothing will break and the patchbay is designed to combine signals.

There are 3 **Bi-directional** patch points which can be used to send signals In or Out of the Kastle via the TRS jacks at the back.
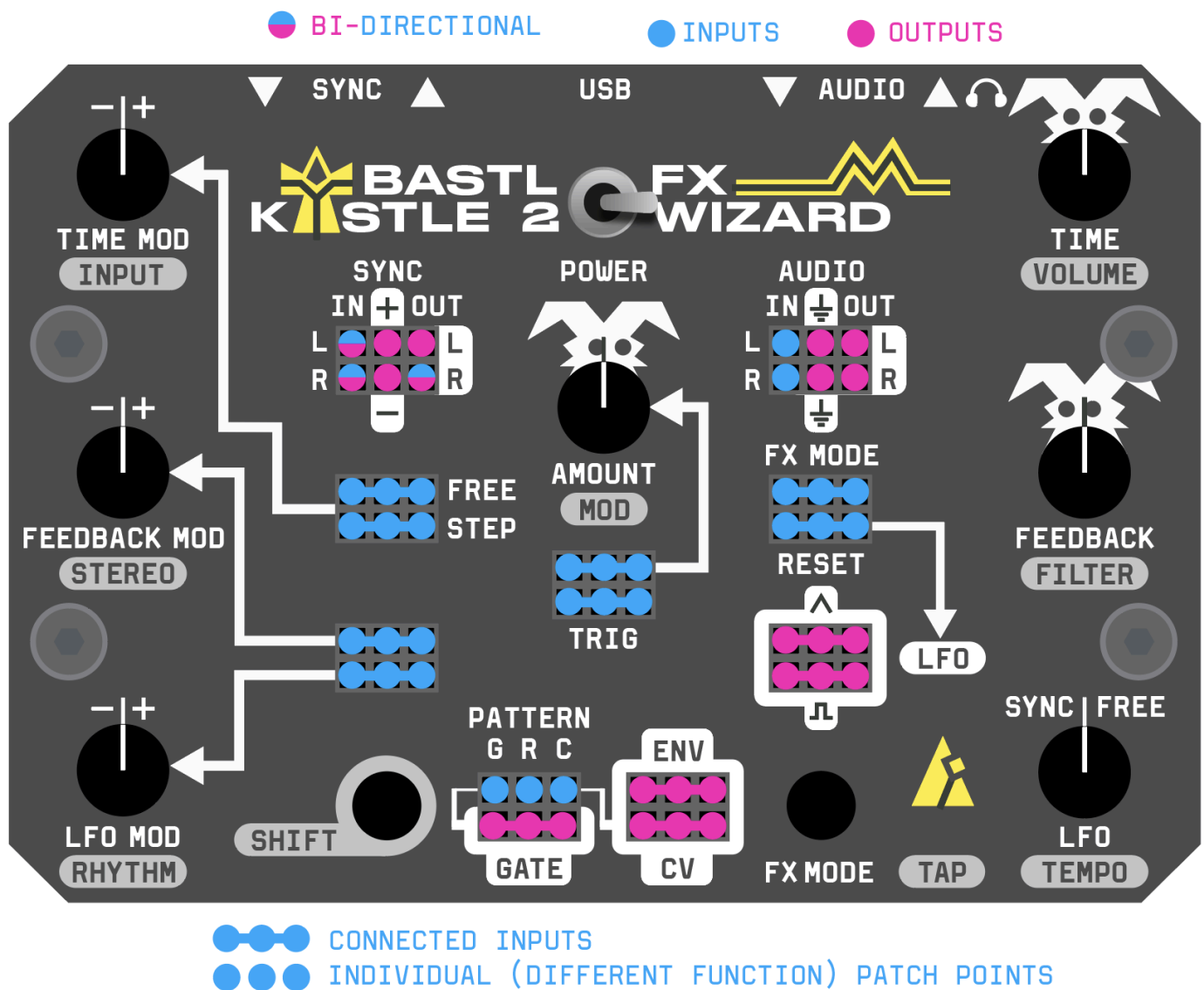
Plus (+) is a logic high output (~5V), minus (-) is a logic low output (~0V). They are resistor protected, patching them together results in half the voltage (~2.5V). Ground symbol ($\equiv$) is a direct ground reference for interfacing multiple devices, breadboards etc.

**Note:** if patching several Kastles or devices with compatible headers you need to connect the grounds of both or all devices. This happens automatically when connecting audio or sync jacks, but if that is not desires use the Ground symbol ($\equiv$) patch point and connect it with the ground or patch point on the other device.

# Tempo generator

The tempo generator is independent from the LFO but the LFO can be synchronized to the tempo. Tempo can be either internal or external.

**Set the internal tempo**
hold SHIFT and turn the LFO knob
or
hold SHIFT and press FX MODE multiple times to TAP the tempo

**Sync to external tempo**
Connect analog clock signal to the SYNC IN.
Hold SHIFT and turn the LFO knob to select tempo divider



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

If Kastle 2 is running on the internal clock the metronome light blinks light pink (magenta) while holding the SHIFT button.

If Kastle 2 is running on the internal clock and ignores the external clock the metronome light blinks orange while holding the SHIFT button. To allow/ignore external clock see the **Advanced settings** section.

# Sync

## *SYNC IN*

To sync Kastle 2 to the external clock, connect the analog clock to the SYNC IN jack. It will detect the clock on the left channel of the jack and use it as a tempo source.

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

Setting the tempo by holding SHIFT and turning the LFO knob will result in selecting the **tempo divider.**

When the clock signal is not detected for more than 2 seconds the Pattern generator will reset to the first step in order to align with your external sequencers when the clock is present again.

**Note:** when the SYNC IN jack is connected the Kastle 2 will always be waiting for the external clock and will never switch to the internal clock. Unless the external clock is ignored. See **Advanced settings**

If a jack cable is not connected to the SYNC IN jack, you can also patch a clock signal to the **SYNC IN patch point** in the patch bay. If a clock is detected there the Kastle 2 will automatically sync to that clock.

When the clock patched through the patch bay is not present for more than 2s (while SYNC IN jack is not connected) the Kastle 2 switches back to its internal clock.

When connecting LFO PULSE output to the SYNC IN patch point, make sure that the LFO is in the free (unsynced) section to prevent glitches.

## *SYNC OUT*

Connect SYNC OUT to the clock input of a receiving instrument if you want it to follow the clock of Kastle 2. You can set the TEMPO on the Kastle by holding SHIFT and turning the LFO knob.

You can also patch from the patch point SYNC OUT to various inputs.

SYNC OUT behaves as SYNC THRU when an external clock is connected to the SYNC IN, meaning you can change clock dividers/multipliers, but the devices down the line will always be in sync with your master clock.

The right channels on the SYNC IN and SYNC OUT jack are routed to the SYNC IN R and and SYNC OUT R patch points and they can be used for sending/receiving other control signals. See section Modular connections for more info.
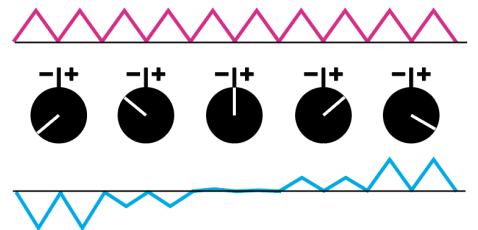
# MODULATION

Kastle2 has several modulation sources. **Pattern generator** is always synced to the tempo, **LFO** is either synced or free and the **ENV** is envelope follower that input responds to the incoming audio.
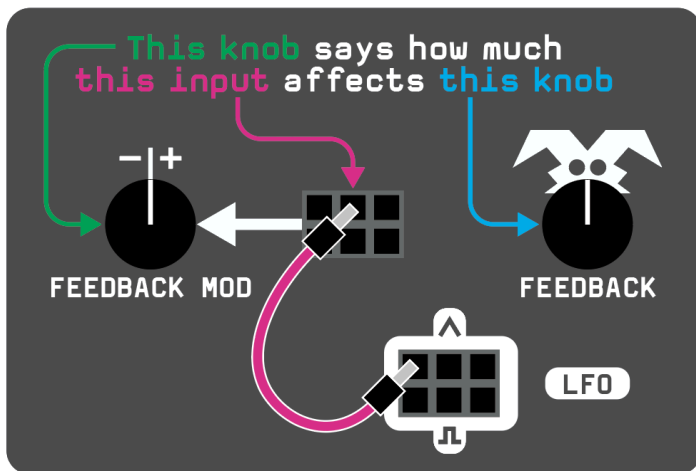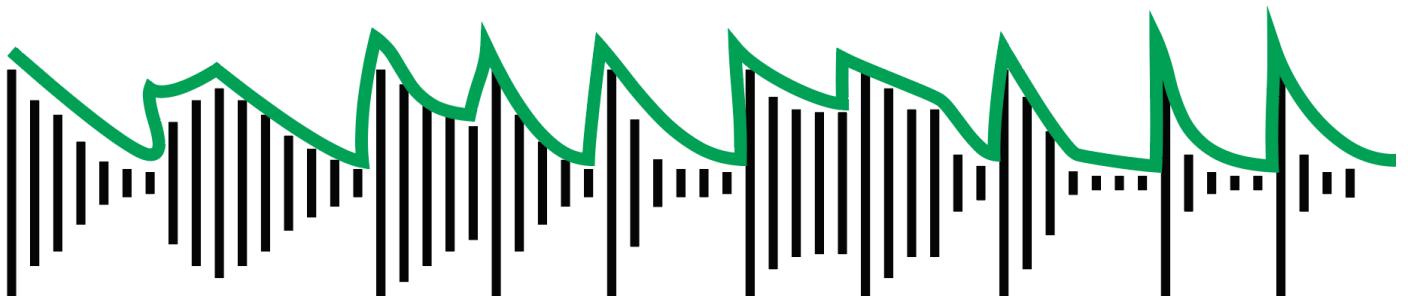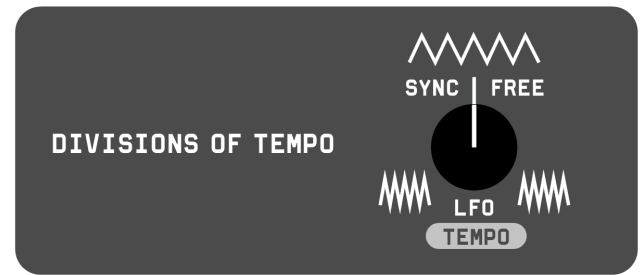


## Envelope Follower

The **ENV** output is an envelope follower representing the loudness of the input signal.

# LFO

**LFO** speed is set on the LFO knob. In the middle the LFO is the slowest and it gets faster in either direction. To the left it is synced to the tempo (cold white light) and the knob sets a tempo divider, to the right it is free running (warm white light).



LFO has TRI and PULSE outputs, RESET input and LFO MOD input

**LFO TRI** - shape is variable with patching LFO PULSE to RESET or LFO MOD (see bellow)
**LFO PULSE** - is high when triangle is rising
**LFO RESET** - rising edge resets to the highest triangle point
**LFO MOD** -attenuverting - allows for variable LFO shape with LFO PULSE patched into it
Note: the modulation does not switch between synced and free LFO - only speeds up or slows down the LFO

You can change the modulation shapes by patch programming.
Please note that the speed of the LFO will also change when using the following methods.
The LFO PULSE output will also change its pulse width, always being high when the triangle is rising and low when it is falling.

Patching the LFO PULSE to the LFO MOD input can tilt the triangle into a ramp or a saw shape when adjusting the LFO MOD. You will need to also adjust the LFO knob to get the desired result since turning the LFO MOD will change the LFO frequency.
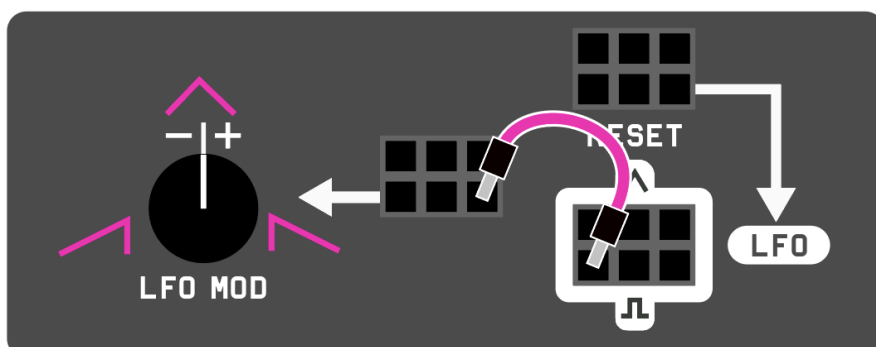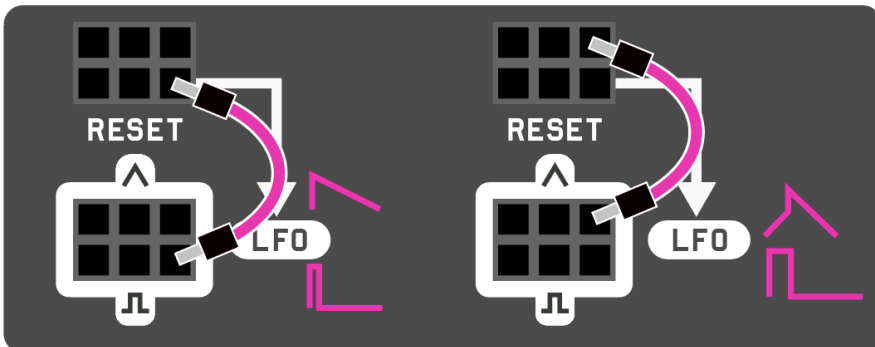
Patching the LFO TRI to the LFO MOD input can make the triangle shape more exponential or logarithmic when adjusting the LFO MOD.
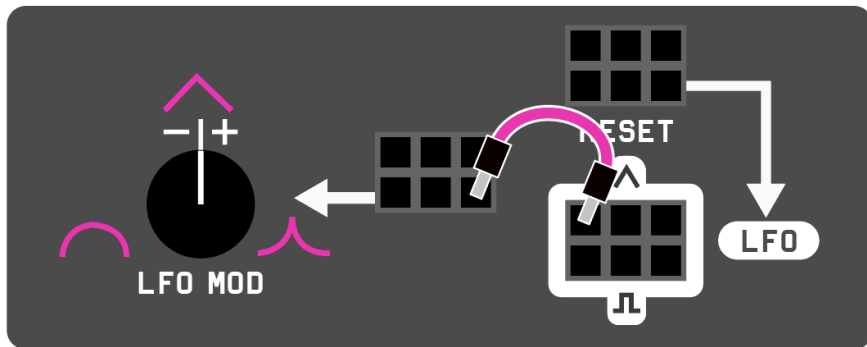


Patching the LFO PULSE to the LFO RESET will change the triangle shape to a saw wave.
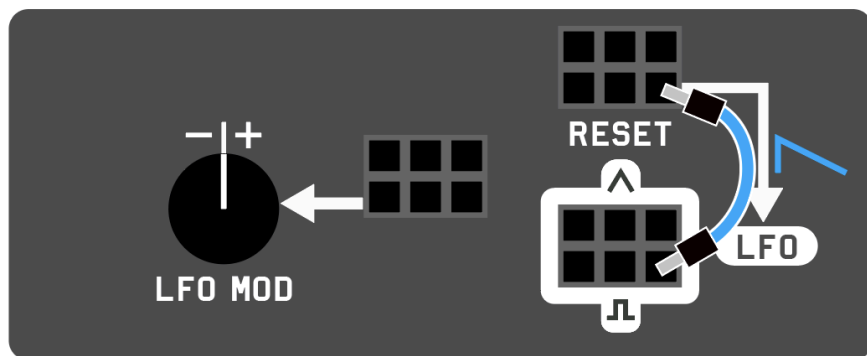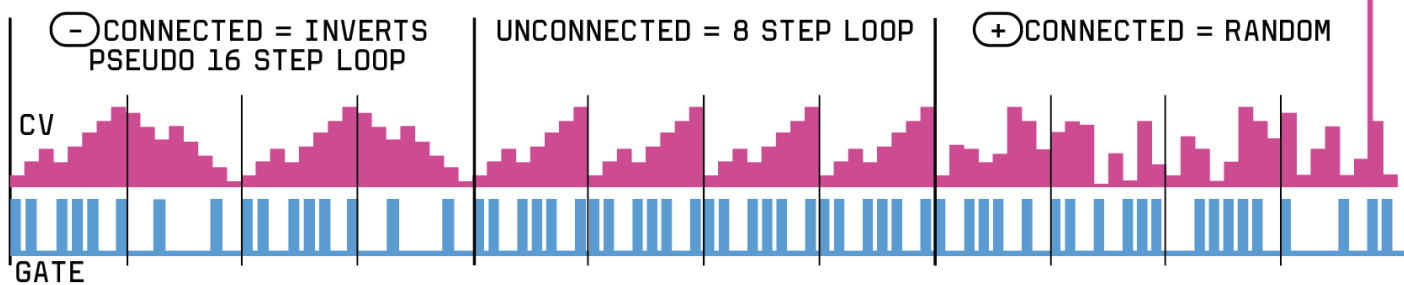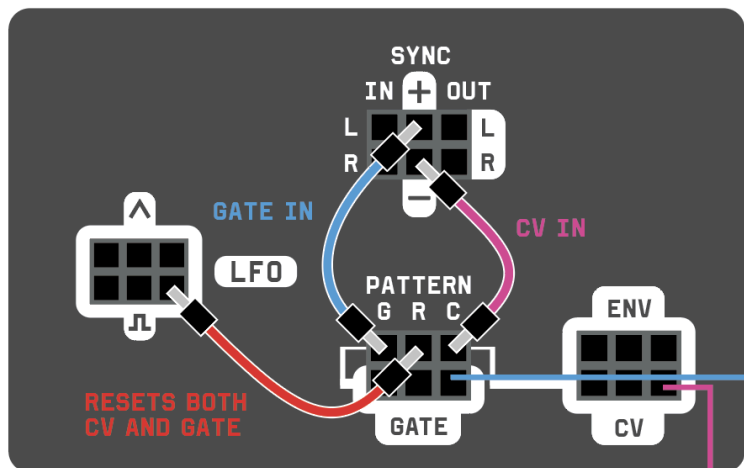


Patching the LFO TRI to the LFO RESET will change the triangle shape to a hybrid wave.

# Pattern generator

The pattern generator generates two signals GATE and CV and is always clocked by the tempo and is 8 steps.
Gate is for rhythmic information and CV is varying stepped voltage. Gate length fixed at 75% of the step duration.



## Reset

The GENERATOR RESET input (middle pin of PATTERN GENERATOR) resets both gate and cv sequences when a rising edge is detected. You can use this for synchronization or to shorten the pattern sequence (with patching in the LFO for instance)

## Gate

Adjust RHYTHM (SHIFT + LFO MOD) to generate the GATE sequence. It will pick from a table of 16 different patterns.

The GATE GENERATOR input (left pin of PATTERN GENERATOR) alters the GATE sequences in three different ways:
   1) When unconnected the gate sequence remains unchanged

2) When connected to + the gate sequence current position is being randomized
3) When connected to - the gate sequence current position is being inverted

## *CV*

The CV GENERATOR input (right pin of PATTERN GENERATOR) alters the CV sequences in three different ways:
1) When unconnected the gate sequence remains unchanged
2) When connected to + the gate sequence current position is being randomized
3) When connected to - the gate sequence current position is being inverted

You can connect varying voltages to these inputs to create semi random and evolving sequences.
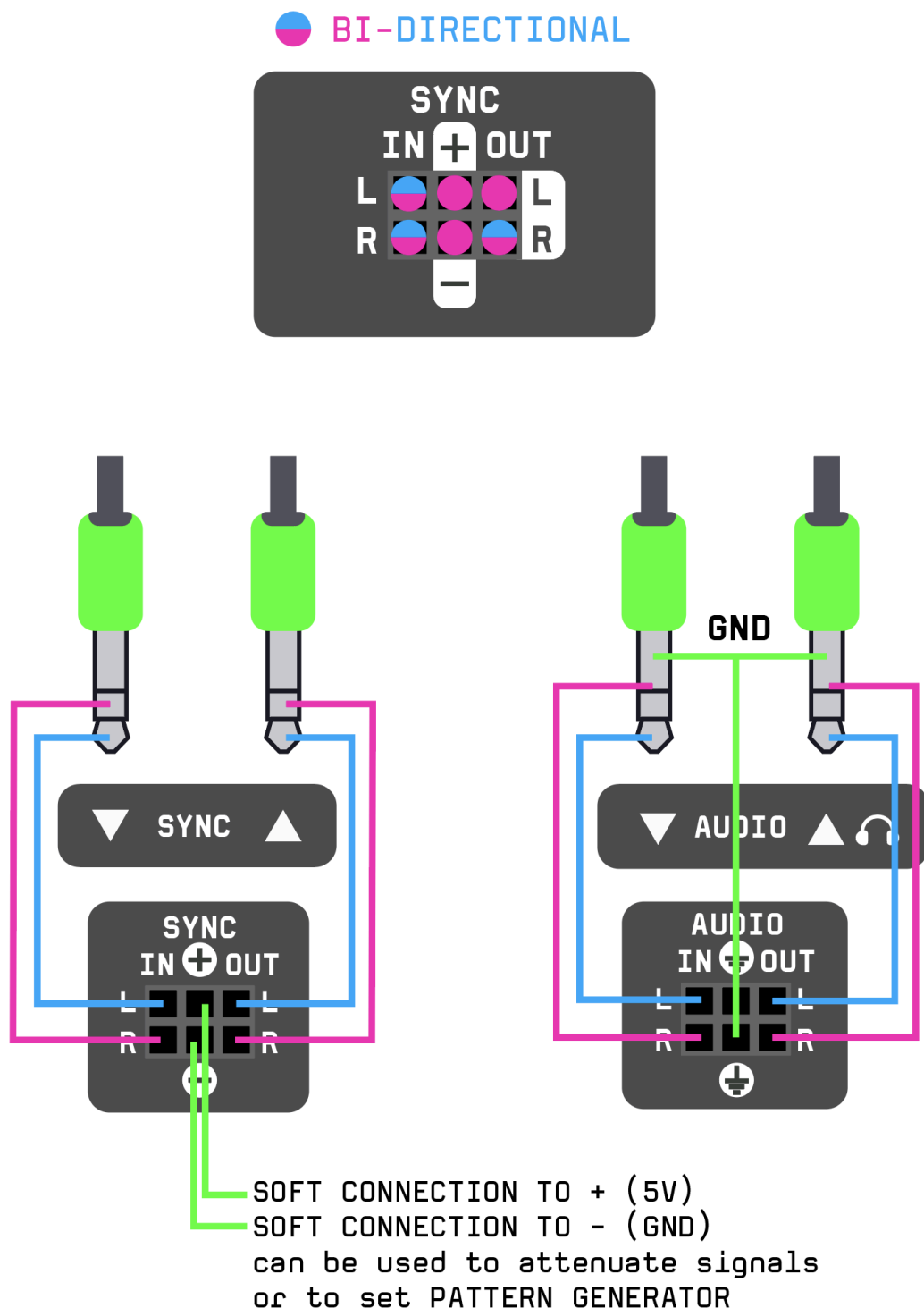
**Note:** When you leave these inputs connected to - the sequence will keep inverting itself so it will seem 16 steps long.

# Advanced connectivity

## Modular connections

Kastle2 has 3 bi-directional ports that can be used to send any signal In or Out the Kastle2 into other instruments. You might need to use a Left and Right splitter adaptor to fully utilize these. They are basically a direct connection to the TRS jacks as shown below.

If you want to use the SYNC IN left channel as something other than sync/clock signal you can ignore it - see **Advanced settings** for more information.



SOFT CONNECTION TO + (5V)
SOFT CONNECTION TO - (GND)
can be used to attenuate signals
or to set PATTERN GENERATOR

# Advanced settings



SHIFT+FX MODE ›5s:
ENTER/LEAVE ADVANCED SETTINGS
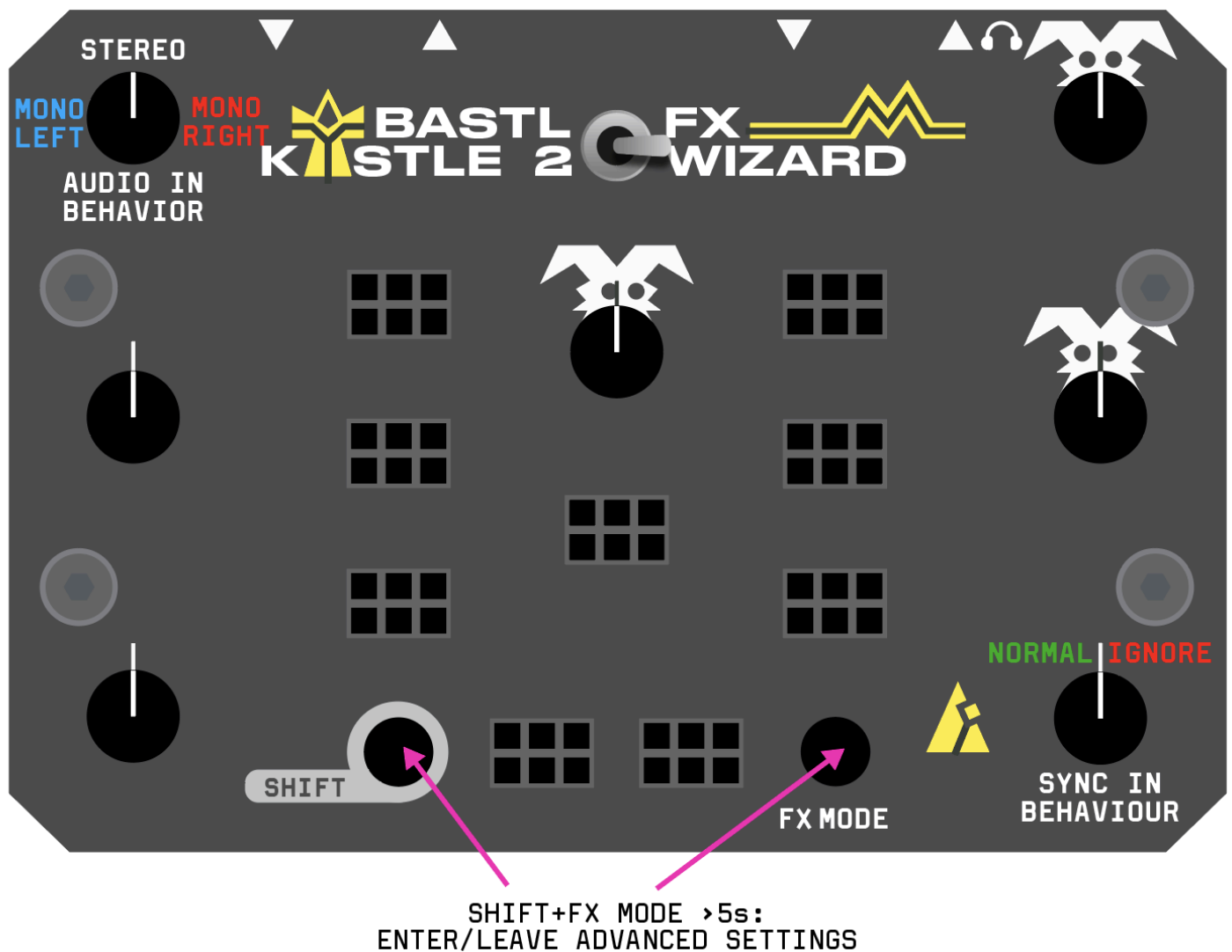
Hold both **SHIFT and FX MODE** buttons for **over 5 seconds** to enter the Advanced Settings mode. These settings will allow you to expand the possibilities of the connectivity of your Kastle.

## Mono input

If you are processing a mono signal and want the left channel to be processed by both left and right channels of the Kastle FX core. That is helpful either if you are sending clock on the right channel and audio is only on the left channel (or vice versa - hello TE-PO) or if your device only sends a mono signal.

When in the Advanced Settings mode turn the **TIME MOD knob** and the light in the KASTLE logo will change colors:

> BLUE: mono input taking only left channel (turn knob left)
> WHITE: stereo input (knob at center)
> RED: mono input taking only right channel (turn knob right)

**Ignore Sync Input**

You can force your Kastle 2 to always use an internal clock and ignore the external connected by the SYNC IN jack and patch input. Then you can also use the SYNC IN jack as a utility to input external voltages and patch them to their desired destinations.

When in the Advanced Settings mode turn the **LFO knob** and the LFO light will change colors:

> GREEN: normal operation (turn knob left)
> RED: ignore sync input (turn knob right)

To leave the mode you can either turn the Kastle ON/OFF (settings are automatically saved) or hold SHIFT and FX MODE for 5 seconds again.

## Memory reset

**Hold SHIFT and FX MODE buttons for over 15 seconds to do the memory reset (reset all settings to the default values tempo, volume settings, input behavior etc.).**

# Firmware update

1) Connect Kastle 2 with a USB-C cable to your computer
2) Turn off the power switch (left)
3) Hold SHIFT and turn on the power switch (right)
4) The Kastle 2 will boot to the update mode (no sound)
5) Copy the .uf2 file to the RPI-RP2 disk showing on your computer.

To check the firmware version, listen to the audio output and boot Kastle 2 into the Test Mode: hold FX MODE button and turn power ON. A voice will tell you the firmware version.

# Patch Tips

The printable cookbook with patchtips is [here](#)
Blank template for your patches is [here](#)
How to sync with Pocket operators guide is [here](#)

# Appendix

## Test Mode

In order to test the HW there is a test mode integrated.

Hold FX MODE and turn power ON to enter the test mode. Listen to the Audio Out and Kastle will tell you the version number.

To do full test do the following:

1. Turn power switch off and connect USB-C cable to Kastle 2 (test will fail if run only on batteries)
2. Connect with stereo TRS cables
   a. SYNC OUT jack to SYNC IN jack
   b. AUDIO OUT jack to AUDIO IN jack
3. Patch these connections:
   a. LFO PULSE to LFO RESET
   b. LFO PULSE to TRIG
   c. SYNC OUT L to SYNC OUT R
   d. SYNC IN L to PATTERN "G"
   e. SYNC IN R to PATTERN "C"
   f. ENV to FEEDBACK MOD
   g. ENV to AMOUNT MOD
   h. CV to FREE TIME MOD
   i. CV to STEP TIME MOD
   j. CV to LFO MOD
   k. LFO TRI to FX MODE IN
   l. GATE to PATTERN "R"
4. Hold MODE and turn the power ON.
5. Kastle 2 will say the introduction.
6. LEDs light red and automatic testing starts. Each successful test is signalized 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. The test should be complete and indicated by green lights and Kastle 2 saying "Test Success".

Kastle 2 FX Wizard user guide version 0.9
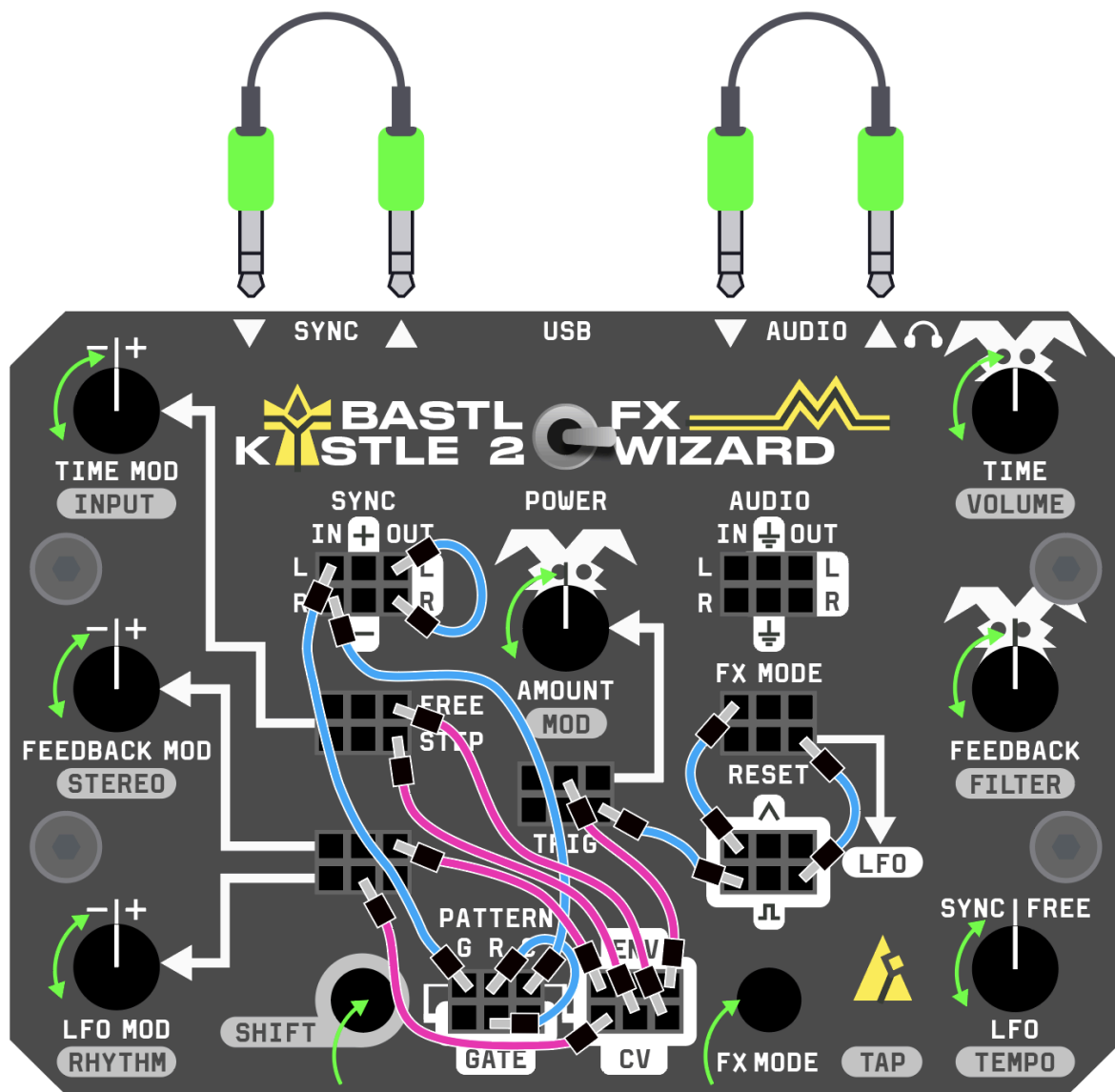
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**GRAPHIC DESIGN:** Anymade Studio

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

❤️‍🔥

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