PØLTERGEIST

ANALOG QUADRAPHONIC
AUDIO MIXER

USER MANUAL

Dear KOMA user,

Thank you for purchasing the KOMA Elektronik Poltergeist Analog Quadraphonic Audio Mixer / Panner / VCA. The Poltergeist is unlike any other eurorack module that has previously existed. Previously you would need multiple modules from various manufacturers to achieve something similar to what we perceive as quadraphonic sound. But now with one single module, you can mix and control signals quadraphonically with complete control and beyond. Four channels each with it's own VCA, plus a stereo auxiliary input, are mixed out to four separate outputs enabling you, the user, to manipulate signals both stereophonically and quadraphonically in entirely new and ghostly ways with its 21 ins and outs, 48 VCAs and unique hands-on mixing features.

Here at KOMA Elektronik, we constantly want to push the envelope of audio experimentation within the hardware world for our users. Quadraphonic sound itself has been around for a very long time but now within your own eurorack system, you can easily pan sounds completely around you and animate it spatially to form four dimensional sonic atmospheres.

With performance in mind when designing the Poltergeist, we included large Pan knobs for total control over the 360 degree range field. Also, clickless solo and mute buttons allow for effortless and instantaneous changes on the fly. Beyond these controls, you can also tailor your sound with extreme detail using functions such as Slope, Field and Origin. With just this mixer, some audio sources and a couple of LFOs, extremely complex sound design can be achieved.

The KOMA team has worked over two years on this entirely new design as this module premiers our patent pending analog method of controlling quadraphony and mixing. Now hook up the Poltergeist to your quadraphonic or stereophonic rig and get lost in a sea of immersive sound!

Invented by our dear friend Erik Dower. Patent Pending.

All the best from Berlin,

The KOMA Elektronik Team

Wouter Jaspers

Christian Zollner

Erik Dower

Hayden Moskowitz

Benjamin Hughes

Otto Mikkonen

Getting Started

1. UNPACK YOUR NEW GADGET

The package comes with the Poltergeist module, a 10-pole ribbon cable with connectors, a small bag with four screws and washers for front panel mounting and this manual.

2. POWER CONNECTIONS

First off; be sure that the bus board of your system is unpowered. Take the connector cable and insert it into the bus board of your modular system. Be very careful when doing so because it is easy to shift the connector and place it incorrectly.

The red marked side needs to be connected on the lower side of a Doepfer bus board and on the marked side of the module (-12V rail). If attached correctly the keyed header will have the right orientation for keyed power systems (e.g. uZeus). Always make sure you align the red stripe on the power connector to the red stripe marker on the module. To be extra safe, make sure that the cable you are using is correctly wired, which means that one connector faces up and the other down when you hold the cable in front of you with the flat side up. The Poltergeist consumes a higher current than an average eurorack module. Make sure your power supply can handle the current rating specified in the Technical Specs.

3. POWER UP

Power up your system and check if all supply rails are up and running (+/-12V), often there are indication LEDs on the bus board showing if the rails are working properly.

4. AUDIO CONNECTIONS

To connect the Poltergeist to a quadraphonic system, plug the front left speaker into the top left jack, the front right speaker into the top right jack, the rear left speaker into the bottom left jack, and the rear right speaker into the bottom right jack. In stereophonic mode, both left outputs and both right outputs correspond to the left and right sides.

Features

All CV inputs are 0-8V.

① SIGNAL INPUT (Audio Input)

AC coupled input for audio signal to be mixed.

② GAIN (Control)

Overall gain control of both Panned and Field signals for each channel. At unity gain when pot is completely clockwise.

③ FIELD (Control)

Adds an inverted version of the input signal to all mixer outputs and does not go through the VCA. When the gain of this signal is equal to the gain of the panned signal, they cancel each other out.

④ ORIGIN (Attenuverter)

Sets controls how much pan modulation is taken from the Master Origin input.

⑤ PAN (Control)

In quadraphonic mode, the control pans over the entire 360 degree panning range. In stereophonic mode, it pans between left and right channels.

⑥ MUTE (Control)

Provides clickless muting of the channel on release of the button so you can press and hold it, then release it at just the right moment.

⑦ SOLO (Control)

Provides clickless soloing of the channel on release of the button so you can press and hold it, then release it at just the right moment.
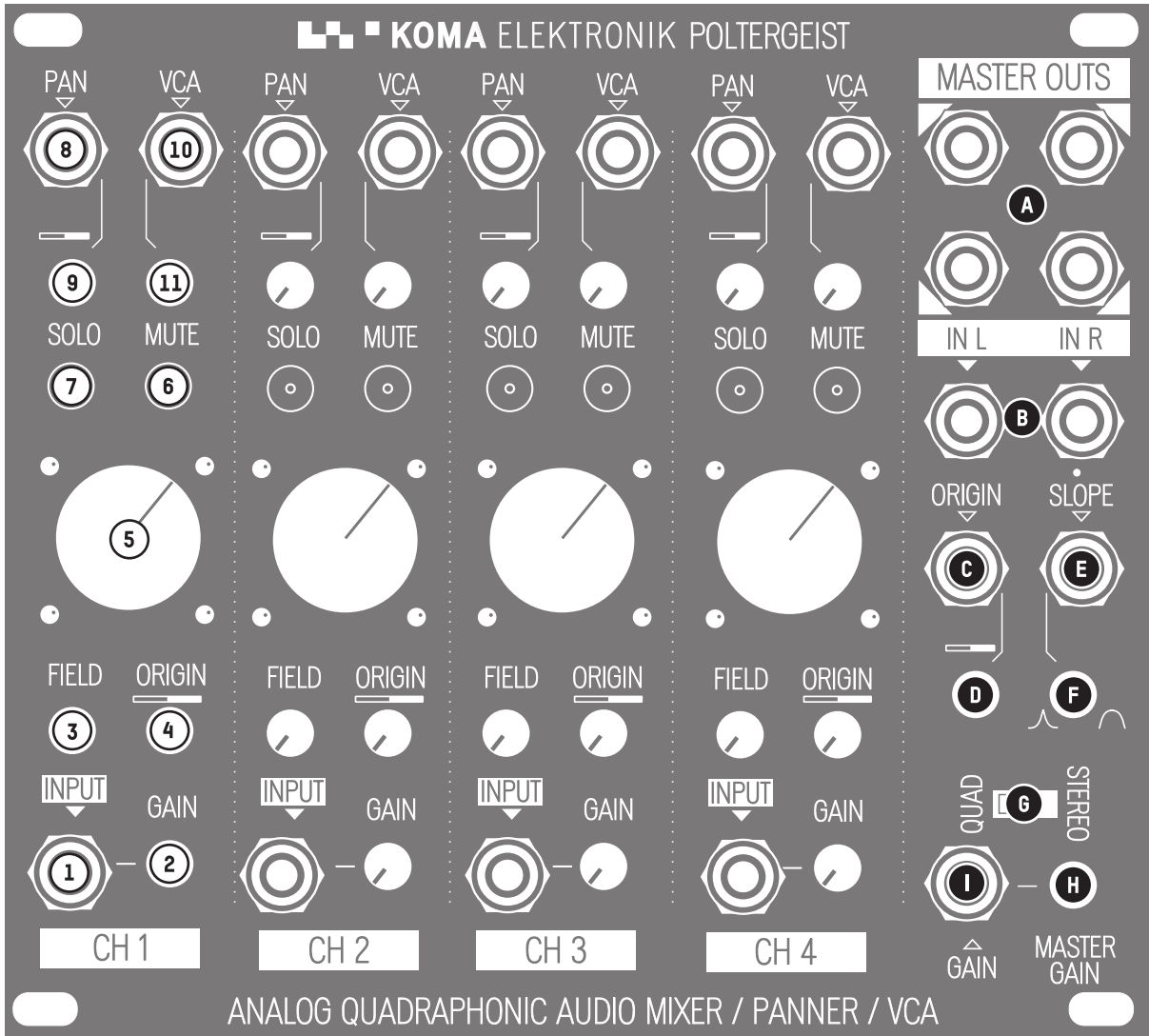
⑧ PAN (CV Input)

Modulates the signal's pan position in the sound field. 0-8V covers the entire 360° range.

⑨ PAN (Attenuverter)

Sets the gain of the incoming CV signal for panning.

⑩ VCA (CV Input)

Controls the level of the voltage controlled amplifier of the channel.

⑪ VCA (Control)

Controls the amplitude of the panned signal. With the pot set at 12 o'clock no signal passes through the VCA. The signal is unity gain with the pot completely clockwise. With it completely counterclockwise, there is a -8v offset.

Master Section

Depending on the Mode Switch setting the outputs behave as such :

Ⓐ MIXER OUTPUTS (Audio Outputs)

	Quadraphonic	Stereophonic
Lower Left	Quadrant 1	Left
Upper Left	Quadrant 2	Left
Upper Right	Quadrant 3	Right
Lower Right	Quadrant 4	Right

Ⓑ AUXILIARY STEREO INPUT (Audio Input)

Input directly to the summing bus (pre master VCA) to add other signals i.e. other mixers or effects processors. When only one cable is plugged into the left input, the signal will go to all outputs. When cables are in both inputs, the left input goes to the outputs 1 and 2, and the right input goes to outputs 3 and 4.

Ⓒ MASTER ORIGIN (CV Input)

CV input that goes to the Origin control of each channel. It goes through an attenuverter both here and at each channel. Modulating the Master Origin shifts the entire scene.

Ⓓ MASTER ORIGIN (Attenuverter)

Sets the maximum amount of shift the CV signal can have at any channel. Inverting the signal will reverse the direction of shift.

Ⓔ SLOPE (CV Input)

Creates variations in the animation of the signals on all channels. Has a 0-8V range.

Ⓕ SLOPE (Control)

Controls the curve of the pan or how long it remains at one output before going to the next. With the pot clockwise, the signal remains at the output longer and then very quickly jumps to the next much like a switch. With the pot counterclockwise, the signal stays at the output for a short time before the volume reduces and begins moving to the next. The panning is linear around 10 o'clock

Ⓖ MODE SWITCH (Control)

Switches between stereophonic and quadraphonic modes.

Ⓘ MASTER GAIN (CV Input)

Half-rectified, inverted CV input where positive CV reduces the Master gain and negative CV is ignored. Designed to make your own compressor using other modules such as envelopes, comparators, etc.

Ⓗ MASTER GAIN (Control)

Sets the maximum gain of the signals on the 4 output jacks.

Tips & Tricks

PAN CV voltage

Use an 8v rising sawtooth waveform into the PAN CV input and set the pan to around 10 o'clock to achieve 360 degree panning. 0V corresponds to Quadrant 1, 2V to Quadrant 2, 4V to Quadrant 3, 6V to Quadrant 4 and 8V goes back to Quadrant 1.

FIELD GHOSTING EFFECT

Use the Field control to create a hole in the sound field that can be moved around with the panner, a sort of ghosting effect. Aside from being a novel effect on its own, you can place other sounds in the hole. This is particularly useful when you want to carve out a unique space for sounds with a similar spectral content.

SLOPE MODULATION

Remember that the slope control changes the pan response of all channels, so once you have a repeating gesture defined, you can adjust/modulate the slope to vary the pattern. For more extreme variation, try running your modulation signal through distortion, wavetables, delay, frequency shifter, or other effects. This can also act as a kind of intensity or density control for the mix, bringing up the energy to the right and thinning it out to the left.


Warranty

KOMA Elektronik warrants its products to be free of defects in materials / workmanship and conforming to specifications at the time of shipment for a period of two years from the date of purchase. During the warranty period any defective products will be repaired or replaced at KOMA Elektronik's option on a return-to-factory basis. This warranty covers defects that KOMA Elektronik determines are no fault of the user.

RETURNING YOUR PRODUCT?

You must obtain prior approval in the form of an RMA (Return Material Authorization) number from KOMA Elektronik before returning any product. Get in touch with us at support@koma-elektronik.com to request the RMA number. All products must be packed carefully and shipped with the KOMA Elektronik supplied power adapter. Sorry, the warranty will not be honored if the product is not properly packed. Once you have received the RMA#, write it on the box together with the word: WARENRÜCKSENDUNG and carefully pack your product, ship the product to KOMA Elektronik with transportation and insurance charges paid, and include your return shipping address.
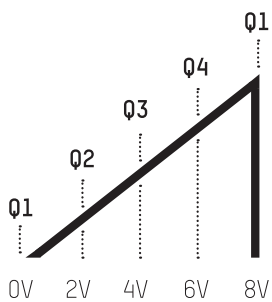
Technical Specifications

CASING

2mm aluminum front panel, powder coated white with silkscreen printing.

DIMENSIONS

3U Eurorack module; 28HP wide, 54mm deep

SHIPPING WEIGHT

500 grams / 1.1 lbs

CONNECTORS

6 audio inputs,
4 audio outputs.
11 CV inputs

POWER REQUIREMENTS

Normal + 510 mA @ +12V
Peak +580 mA @ +12V
Normal -460 mA @ -12V
Peak -490 mA @ -12V

Imprint

Example Patches

01
THE NARCISSIST

Plug one of the main outputs into a multiple. Then take the signal to the speaker and also into an envelope follower. Connect the env. follower output to the Master Origin CV Input. Carefully set the Origin control of each channel. Any time a sound goes to the env. followed output channel, all sounds will be pushed away from that output. Invert the Origin controls and all sounds will be attracted to that output.
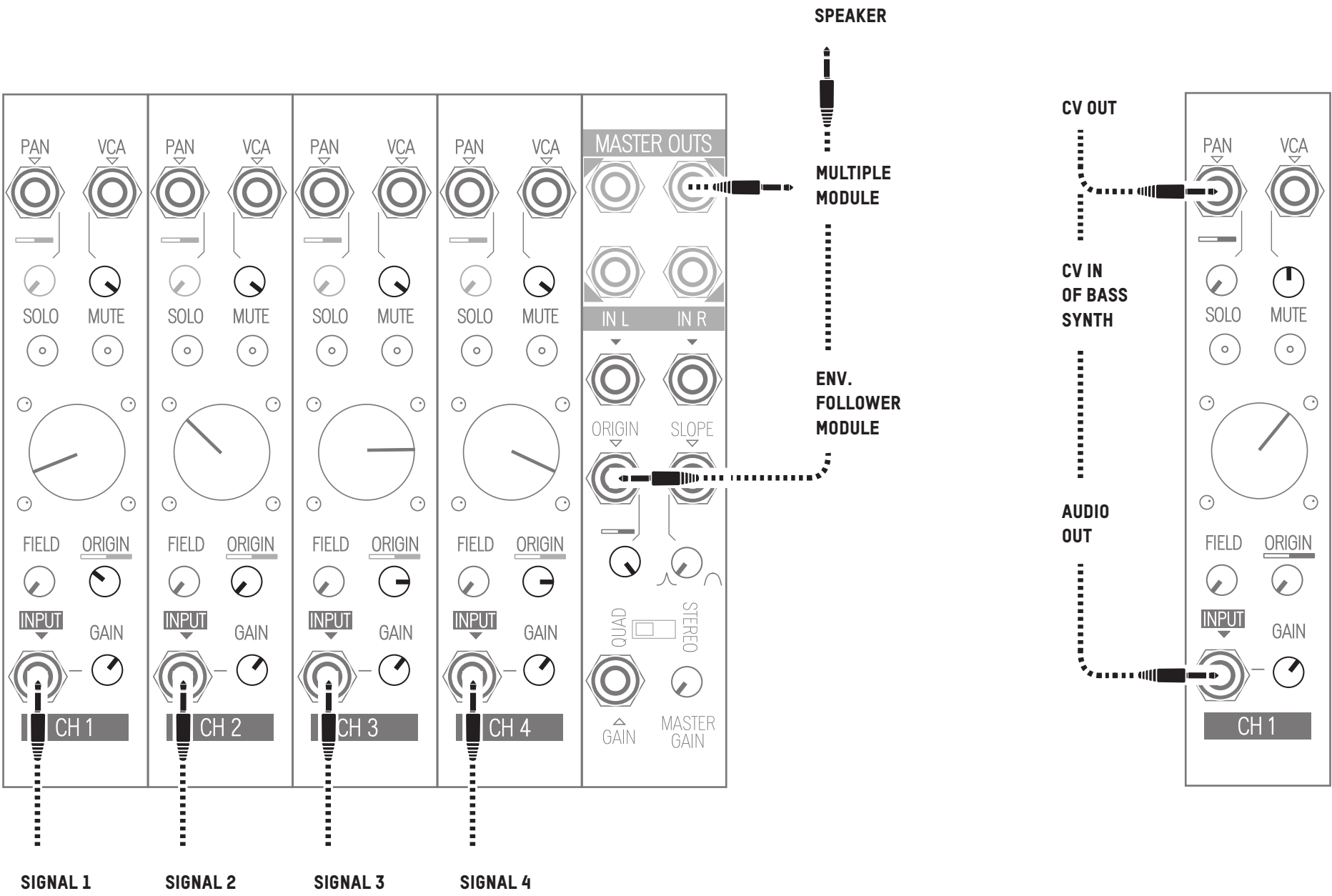
02
CROSSOVER

Input your bass synthesizer to one channel. Also take the pitch CV that controls the synth to the Pan CV Input so the sound moves along with the melody.

03
WHACKAMOLE

Route the kick drum to all 4 outputs via the Field control on a channel with the VCA turned off. The bassline is on another channel. Set the pan position of both channels the same and the envelope from the bass sound to the VCA CV input on the kick drum channel. Any time the bassline is heard, the kick drum is silenced, but only where the bass is in the quadraphonic field.
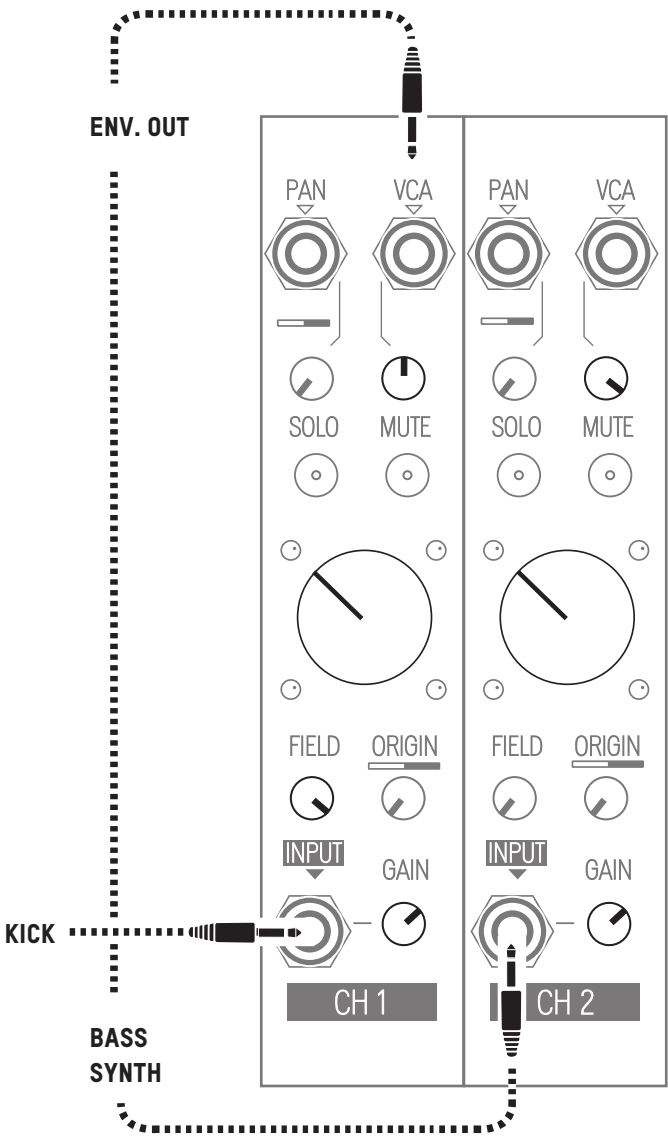
04
DOPPLERGANGER

With a pitched sound going through 2 channels, use a slow attack envelope and connect it to the Origin input in the master section. Now take a triggerable LFO and connect it to the VCA CV input of both channels, and to the pitch CV input of the audio source. Match the attack time of the envelope to one period of the LFO. Now set the Pan pot of the first channel so the sound comes out of output 3, and the second channel all the way to the right so it comes out of output 1. Set the Origin pot on the both channels to the right and adjust the Origin pot in the Master section to the left. If the envelope and the LFO are triggered at the same time you will hear the same sound coming towards you from the front and moving left to the back, and from the back moving right to the front.
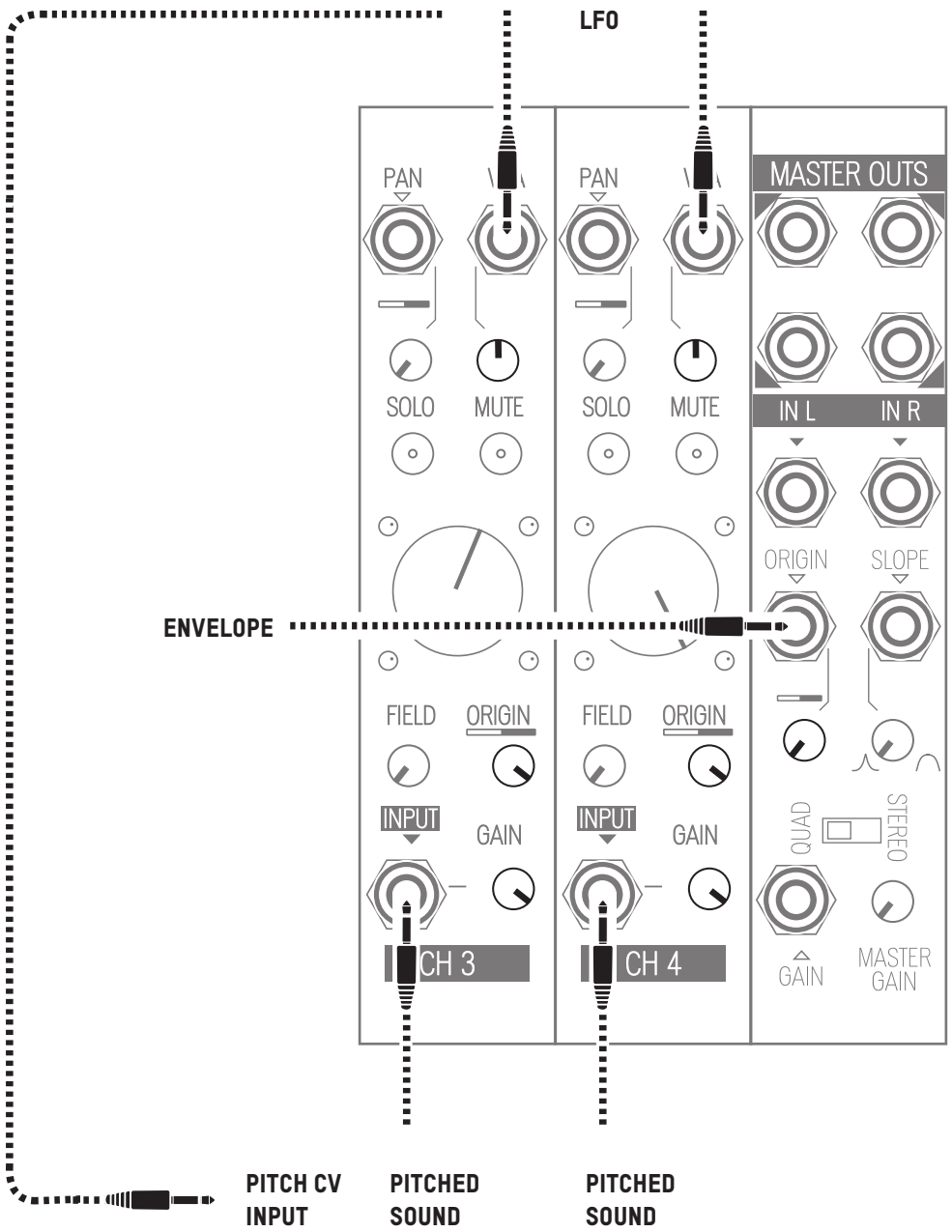
05
THE RED SEA

Set the pan position of all channels to center front. Run vocals through an envelope follower and patch the envelope follower to the Origin CV input. Set the Origin attenuverter fully counterclockwise on channel 1, 10 o'clock on channel 2, 2 o'clock on channel 3, and 4 o'clock on channel 4. The vocals will move the signals in different directions.
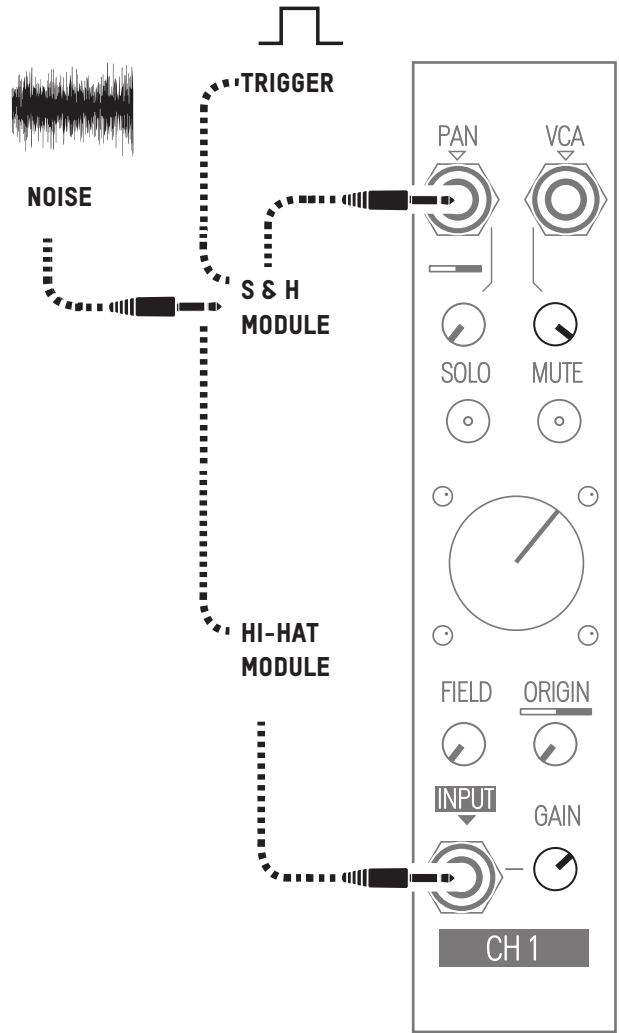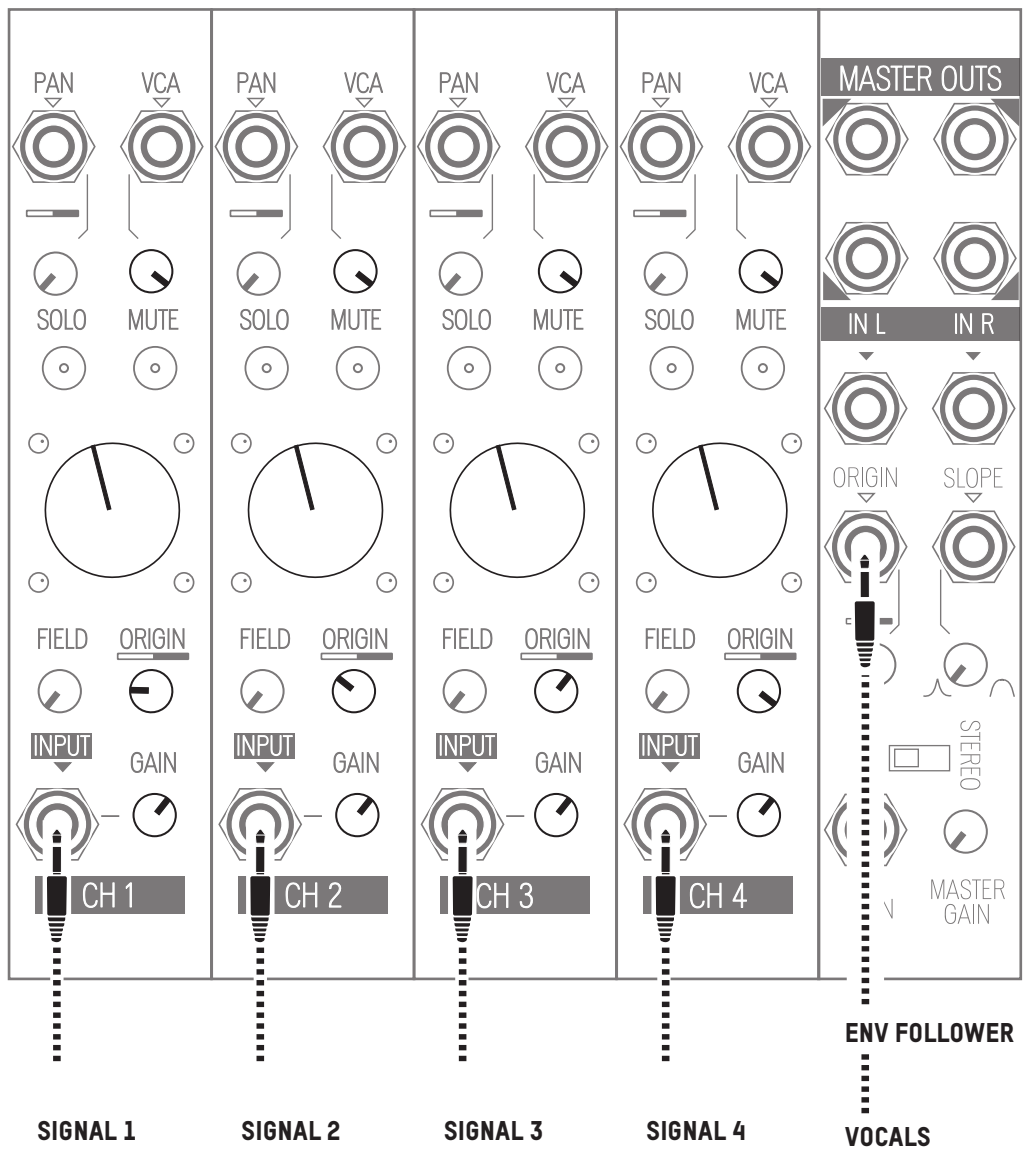
06
BRUCE BICKFORD

Patch your hi-hat sound into a channel. Take the trigger for your hihats also to clock a S&H module that is processing noise. Then take the CV from the S&H module into the channel's Pan CV Input to move the hihats randomly around the quadraphonic field