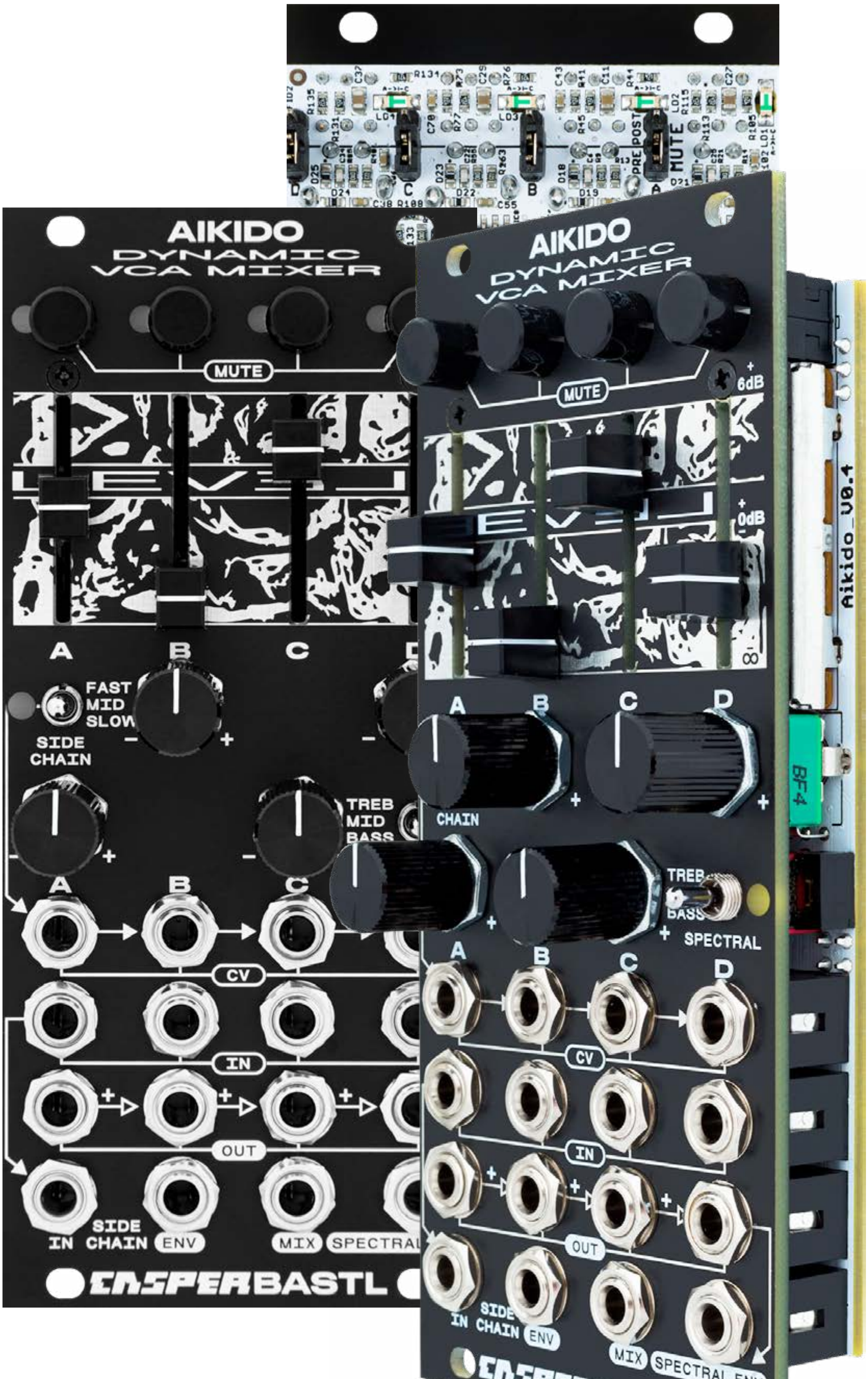
AIKIDO
DYNAMIC VCA MIXER



EASPERBASTL

AIKIDO

DYNAMIC VCA MIXER

Aikido is a performative quad VCA mixer with flexible submix routing and two styles of integrated envelope followers. Clever normalization allows ready-to-go sidechain compression, expansion, and rapid routing experimentation.

Clickless mute switches and level faders make for immediate performability, while dedicated attenuverters on each channel make it a powerful and flexible quad VCA. The main mix output is accompanied by individual VCA outputs with patch-programmable cascading mix routing. The Side Chain envelope follower offers 3 different response curves, while the Spectral Follower can be set to focus on treble, mid or bass frequencies.

In a modular system, Aikido can become your central mixing hub or a powerful utility. Thanks to the envelope followers, it allows signals to interact and mix in new ways. Because the VCAs are DC coupled, Aikido can be used for flexible modulation routing as well. As a martial art, Aikido teaches you how to harness the power of your opponent and use it to your advantage. With the help of the Aikido module, your modular system can become an arena where anything is possible and small signals get to wrestle over big ones.

The Side Chain envelope follower input is normalized to input of Channel A, but can be overridden by plugging in any external signal. Its output is normalized to the CV paths, so you can start compressing instantly. Patch a kick drum to Channel A and use the attenuverters to compress (CCW) or expand (CW) other signals. The switch lets you select the envelope follower response time.

The Spectral Follower listens to the Channel D output (which can also be your mix output, thanks to the cascade mixing), and you can select with a switch whether it focuses on high, mid, or low frequencies. Patch it anywhere to make a spectral compression!

Several Aikido units can be daisy chained to create larger cascading mixers.

FEATURES

4 VCA channels - each has:

- clickless mute with light indication
- level fader with 6 dB boost
- CV input with attenuverter
- input (DC coupled)
- output (DC coupled) cascaded mixing

Mix output (AC coupled)

Side chain envelope follower

- input (normalized to A input)
- output (normalized to CV inputs)
- switch to select response time

Spectral envelope follower

- input taken from Channel D output
- patchable output
- switch to focus the follower to low, mid, or high frequencies

Backside jumpers

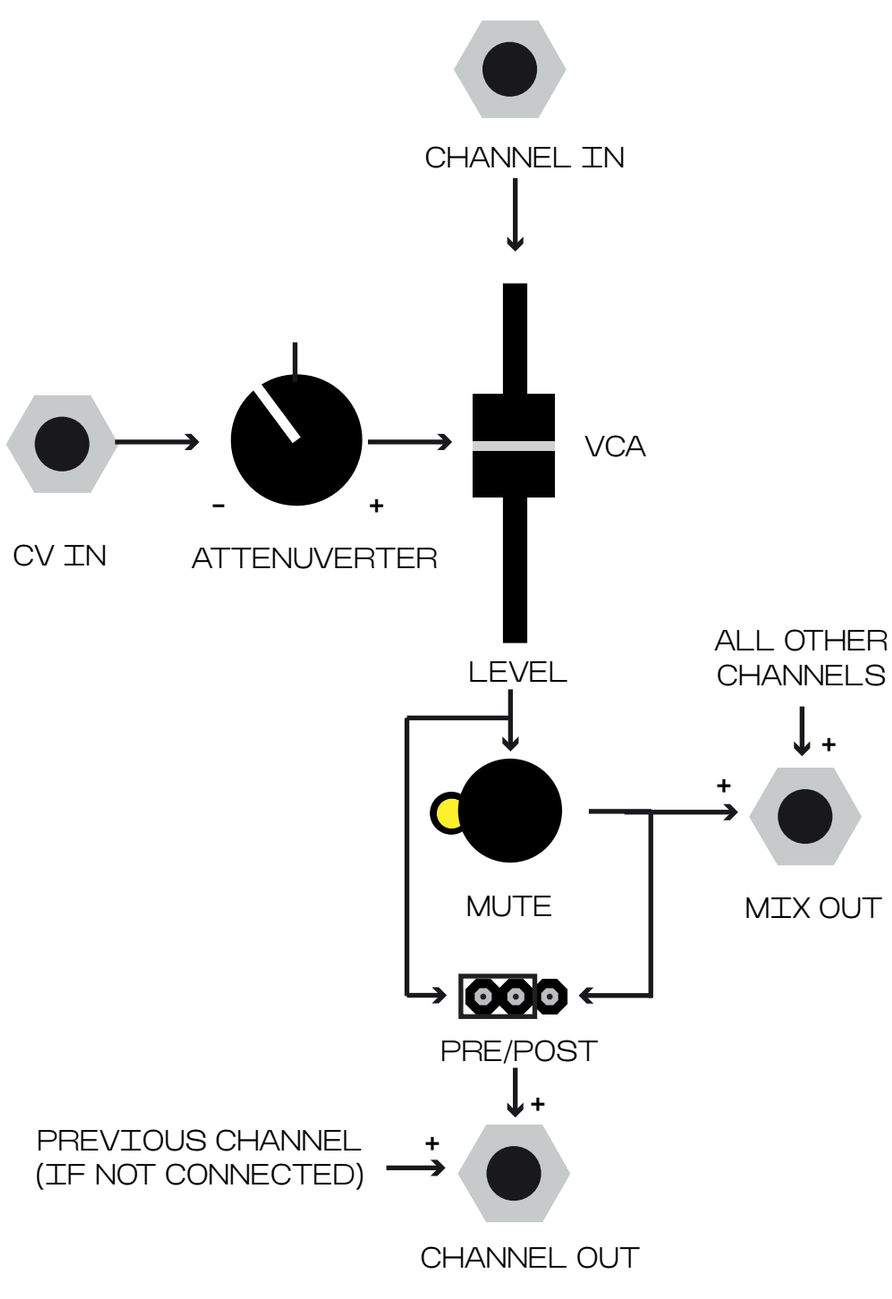
- select whether direct VCA outputs are pre/post Mute
- cascaded mixing input and output (joins 2 Aikidos to 8 channel mixer)
- main mix input and output (for chaining the normalized MIX outputs), compatible with BUDDY

TECHNICAL DETAILS

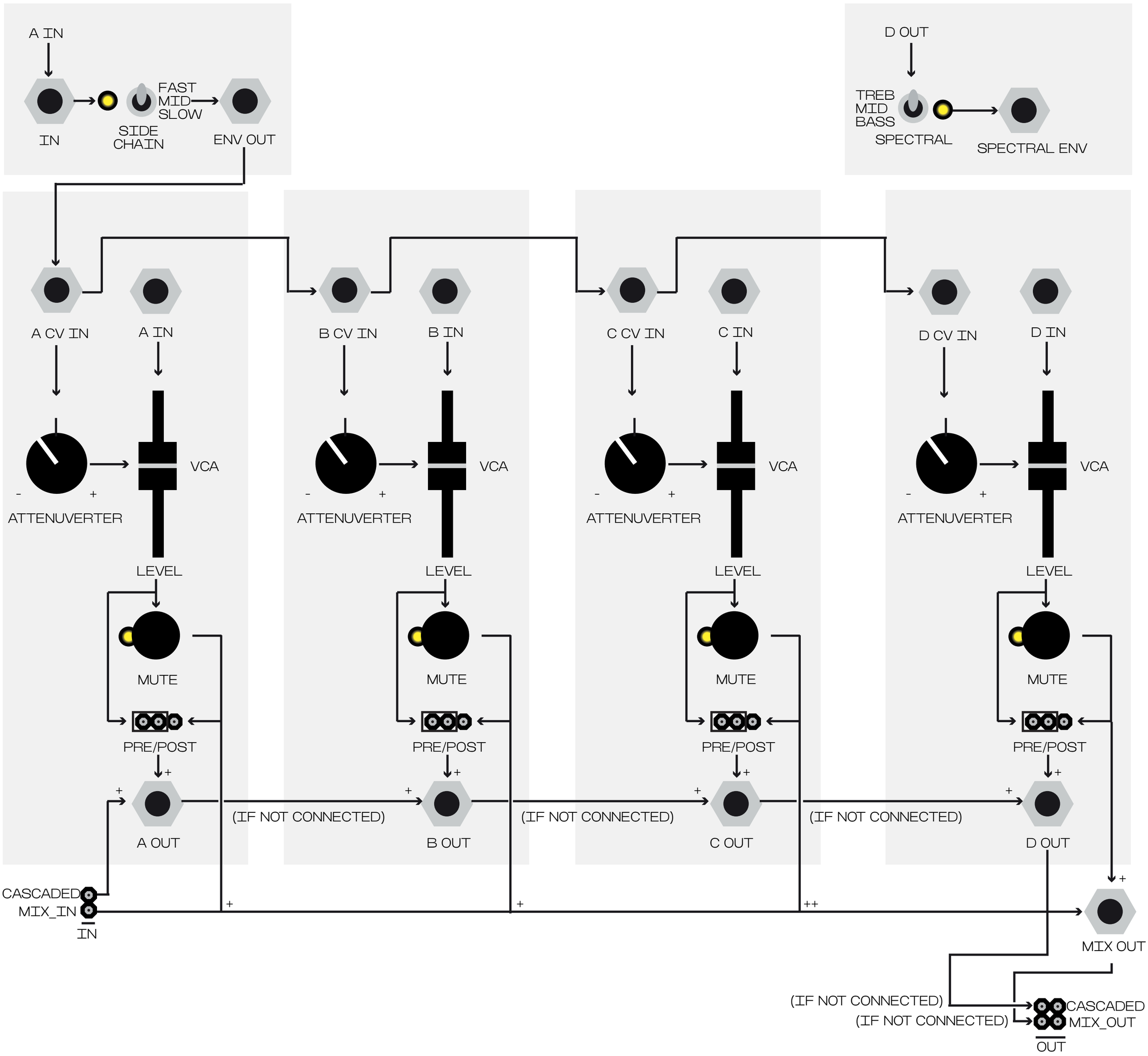
- 11 hp
- PTC fuse and diode protected 10pin power connector
- 24 mm deep
- Current consumption: +12V <120 mA, -12V <120 mA

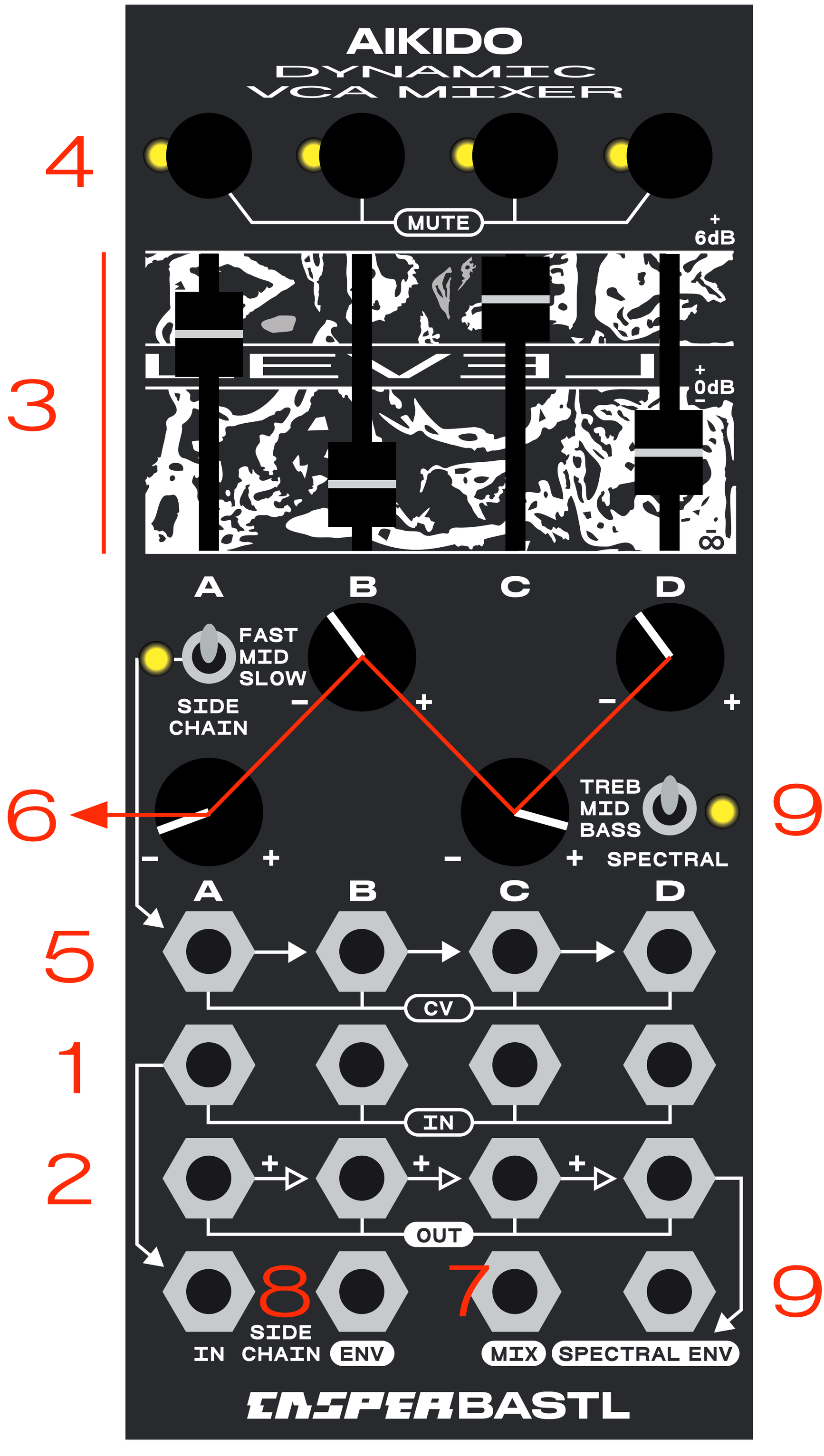
MANUAL

Here is a block diagram of one channel:



And here is a diagram for the whole module:





1

The VCA signal inputs are DC coupled and accept both audio and modulation.

2

The direct VCA signal outputs are DC coupled and they mix in a cascading manner. The output from Channel D will have all the channels mixed together. Plugging a cable to another output will break the cascading mixing chain. If you plug all channels A, B, C, and D, they become independent outputs. Plugging a cable only to Channel C OUT will have A, B, and C mixed.

3

The offset LEVEL fader opens and closes the VCA. It opens to unity gain (0dB) at about midpoint and amplifies up to +6dB when all the way up. The boost is very useful for compression and feedback. The VCA CV and the offset LEVEL fader combine to control the channel volume.

4

The clickless MUTE switch mutes (light off) or unmutes (light on) the corresponding channel. Press and release the switch slowly to create fade-in and fade-out effects.

The MUTE switch always determines whether the channel is present in the MIX output. Using the jumper on the back, you can select whether the direct VCA outputs are affected by the MUTE switch or not. Set the jumper in the PRE position to have them NOT affected, or in the POST position to have them affected by the MUTE switch.

5

The CV input affects the gain between a VCA's input and output. CV inputs are linear. The CV signal goes through the attenuverter and is mixed with the LEVEL fader. The SIDE CHAIN envelope follower is normalized to the Channel A CV input. The CV input from Channel A is normalized to Channel B, from Channel B to Channel C, and from Channel C to Channel D. Therefore, if no cables are plugged into the CV inputs, all the channels will be listening to the SIDE CHAIN envelope follower. Plug cables into the inputs to control the VCAs independently.

6

The attenuverters adjust how much of the signal at the CV input is applied to the VCA. Set them to the center (there is a notch) to have no effect. Turn them to the right to gradually increase how much the CV input affects the level. Turn them to the left to gradually increase how much the inverted version of the CV input affects the level. When used with envelope followers, turning to the left creates a compression effect, while turning to the right creates an expansion effect.

7

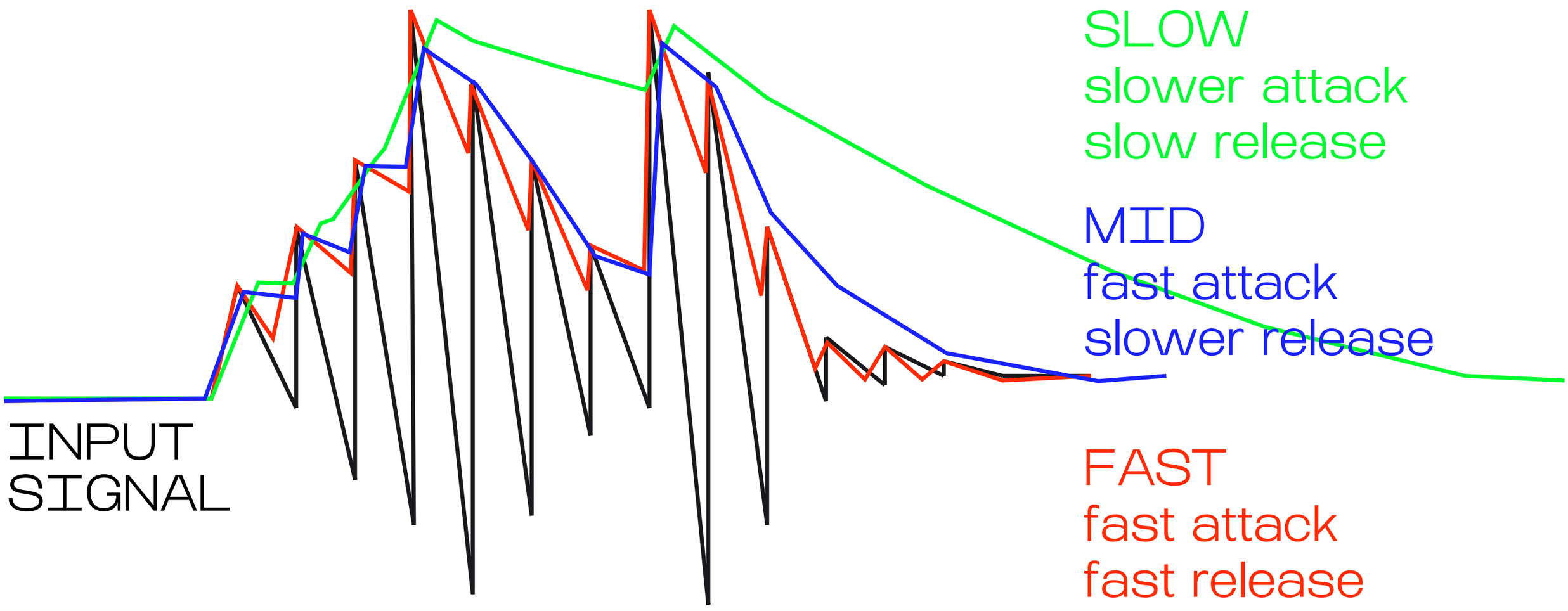
The MIX output has all channels mixed together. It is AC coupled, which makes it suitable for audio signals, and it removes any excess DC offset. The state of the MUTE switches is always reflected in the MIX output.

8

The SIDE CHAIN envelope follower monitors the input level and reflects the signal volume as a CV value. The Channel A input is normalized to SIDE CHAIN IN. To use SIDE CHAIN IN with any other signal, plug a cable into it. The SIDE CHAIN ENV output is normalized to Channel A CV input, which is normalized further to channels B, C, and D. This makes the setup ready for compression.

The SIDE CHAIN switch allows a choice from 3 response curves, which is useful for 3 different compressor settings. The FAST setting has a fast attack and a fast release and is suitable for tight compression. MID is an all-round common setting that will just work: still a pretty fast attack, but a slower release. The SLOW setting is useful for more exaggerated side-chain effects and has a much longer release and attack.

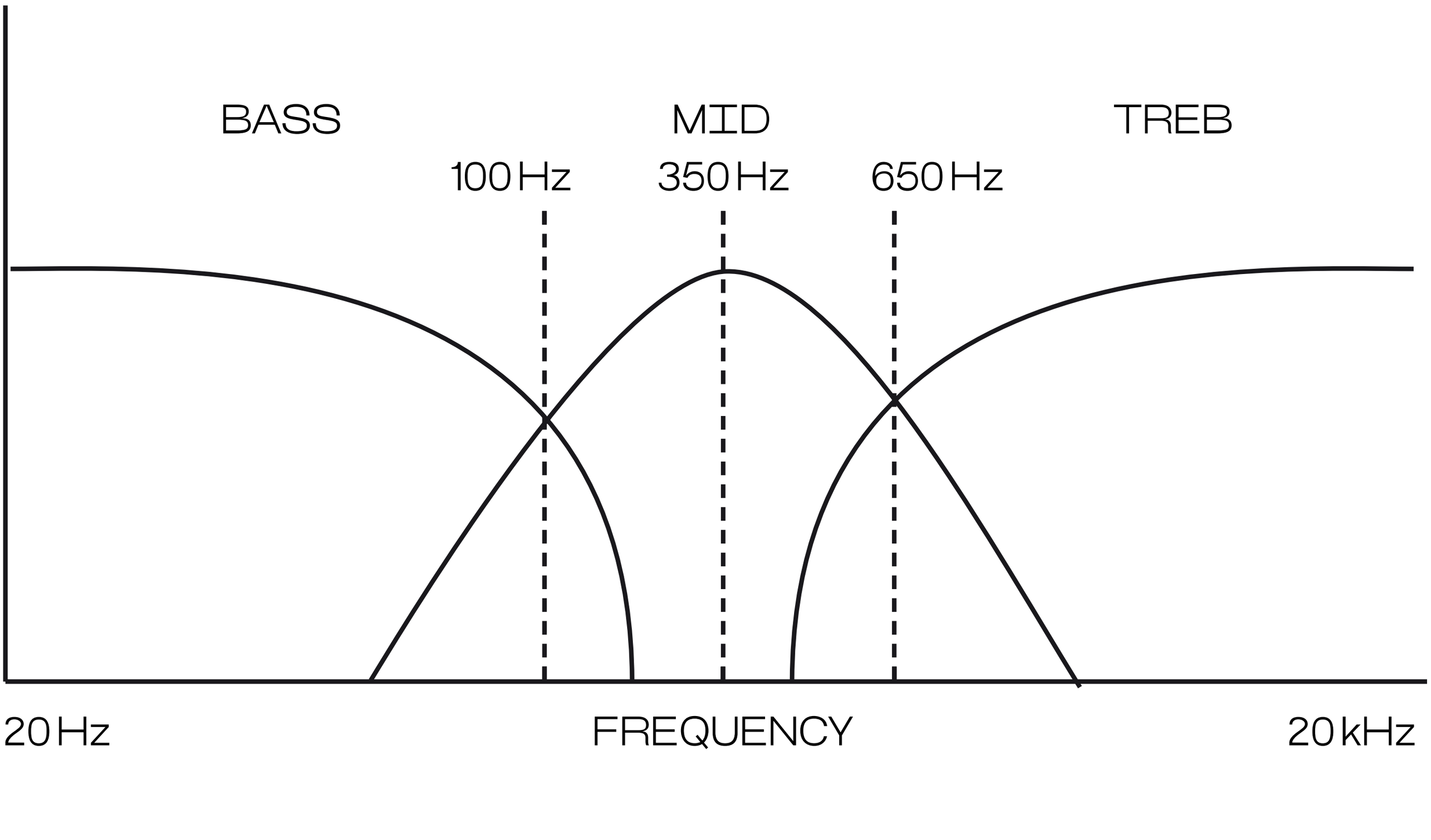
ENVELOPE FOLLOWER RESPONSE



Tip: Send triggers to SIDE CHAIN IN and use the SIDE CHAIN switch to get different envelopes. Use these envelopes for compression or use them independently.

The SPECTRAL envelope follower has a similar time response to the MID setting of the SIDE CHAIN follower, but its main asset is that you can select the frequency band it responds to with the SPECTRAL switch. The SPECTRAL envelope follower listens to the Channel D output (cascaded mix output) and has a dedicated output you can patch anywhere. In the BASS setting, the SPECTRAL follower responds primarily to frequencies below 100 Hz; in the TREB setting, it responds to frequencies above 650 Hz; and in the MID setting, it responds to frequencies between 100 Hz and 650 Hz.

SPECTRAL ENVELOPE FOLLOWER FOCUS



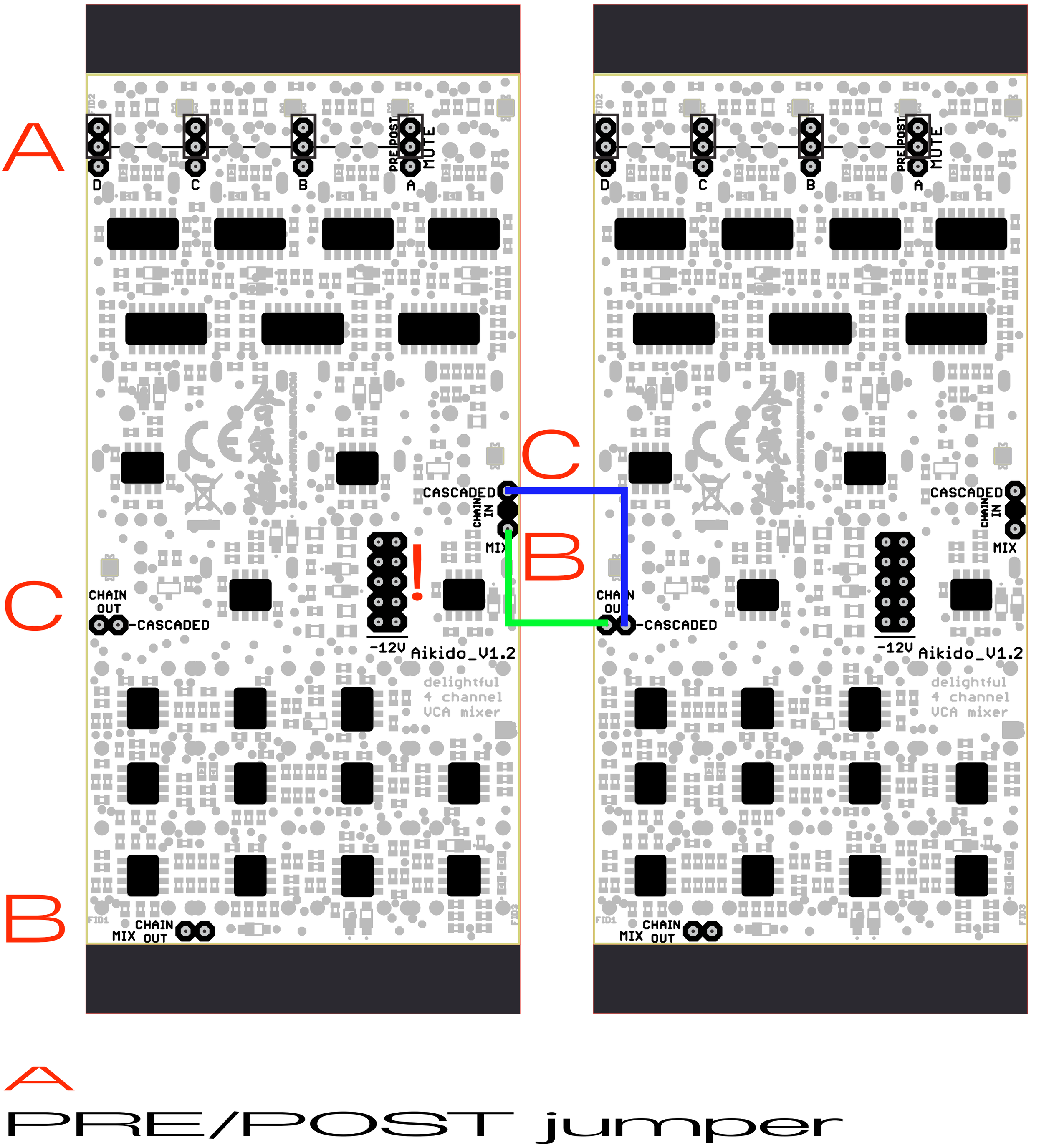
!POWER!

Before connecting the ribbon cable to this module, disconnect your system from power! Double check polarity of the ribbon cable and that it is not shifted in any direction. The red cable should match the -12V rail, both on the module and on the bus board.

! PLEASE MAKE SURE OF THE FOLLOWING

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

Although there are protection circuits in this device, we do not take any responsibility for damage caused by the wrong power supply connection. After you 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.



PRE/POST jumper

Use this jumper to configure whether the direct output of a channel is pre or post MUTE switch. If in the PRE position, the channel output will NOT be affected by the MUTE switch. If in the POST position, the channel output will be affected by the MUTE switch.

B

MIX IN / MIX OUT CHAIN HEADERS

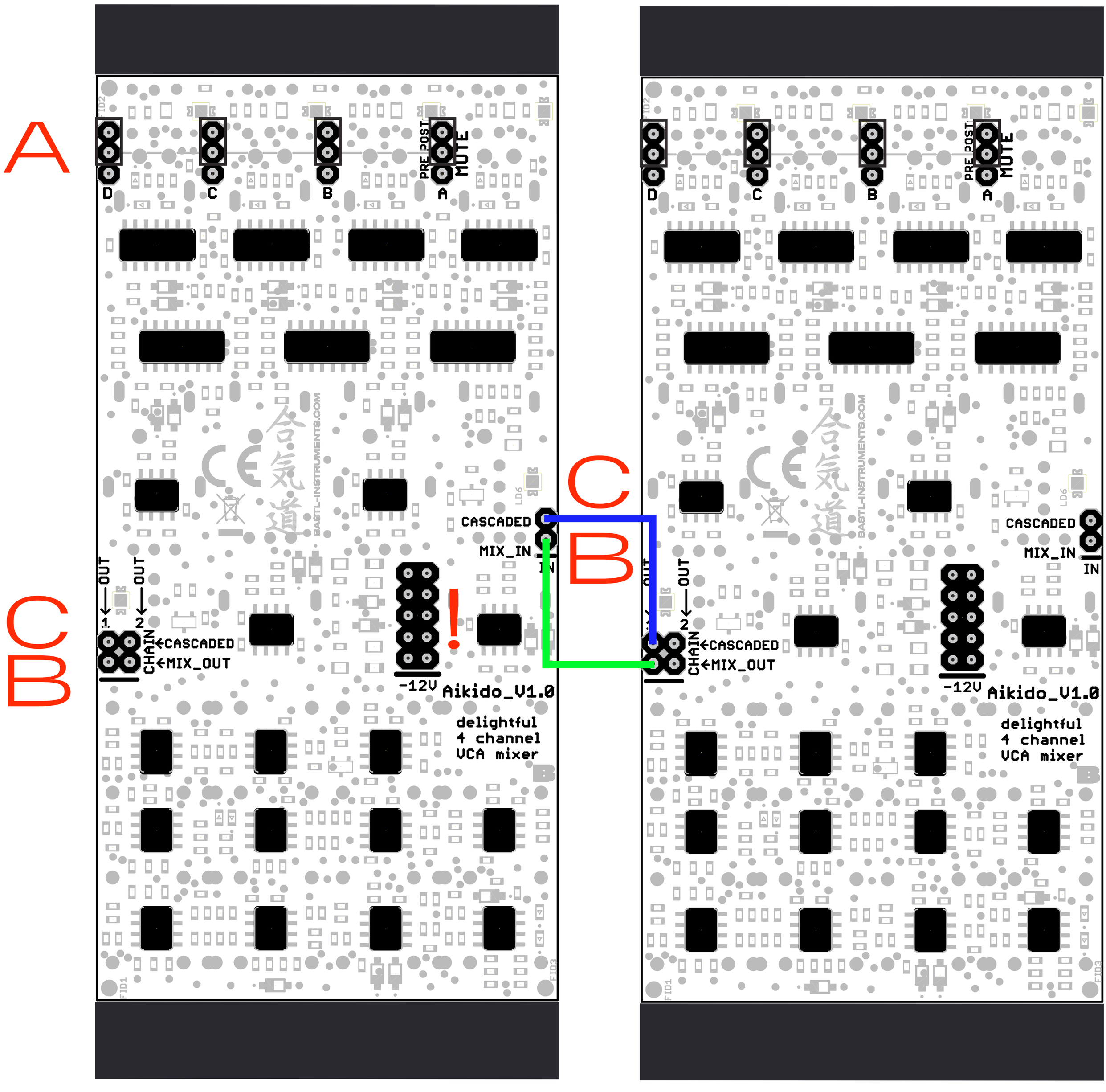
Use jumper wires to chain multiple Aikido modules together. The MIX_OUT headers are doubled so you can connect them to the left and right chain inputs of BUDDY or to any other two destinations. If the MIX_OUT jumper pin from the first Aikido is connected to the MIX_IN pin of the second Aikido, the MIX output from the second Aikido will have the sum of both modules unless the MIX output on the first Aikido is plugged in. In that case, the MIX OUTs on each module will be independent.

C

CASCADED CHAIN HEADERS

Use jumper wires to chain multiple Aikido modules together. If the CASCADED OUT jumper pin from the first Aikido is connected to the CASCADED IN pin of the second Aikido, the channel A output and following outputs on the second Aikido will have the sum of both modules unless the channel D OUT on the first Aikido is connected. In that case, the cascaded mixing of the outputs of the second Aikido will be independent.

AIKIDO PCB v1.0



PATCH TIPS

CLASSIC SIDE CHAIN

Patch your kick drum to Channel A and your bass to Channel B. Use the Channel A LEVEL fader and attenuverter to compress/expand the kick drum and shape its transient. Turn the Channel B attenuverter to the left to side-chain the bass to the kick drum. Because the Side Chain envelope follower listens to the Channel A input, you can mute the kick drum and still hear the side-chain compression. If you want the side chain compression to be present only when you can hear the kick drum, patch Channel A OUT to the SIDE CHAIN IN. Also, make sure you have the jumper of Channel A in the POST mute position.

GATED FIELD RECORDING

Run your drum section to Channel D. Take a field recording or any recorded audio to Channel A. Patch SPECTRAL ENV to the Channel A CV input. Listen to Channel A OUT. Set the LEVEL fader A down and open the Channel A attenuverter. The recording is now being gated by the drum section and turned into a rhythm. Use the SPECTRAL switch to select where in the rhythm it gates (BASS – kick, MID – snare, TREB – hats).

CLASSIC TREMOLO

Connect a signal to Channel A IN and an LFO to the Channel A CV input. Open the attenuverter to create classic tremolo effects.

RING MOD DRONING

Connect an oscillator to Channel A IN and another oscillator to the Channel A CV input. Bring in the attenuverter to create ring modulation. Plug another oscillator into Channel B IN and listen to the MIX output. Tune the frequencies of the oscillators close to each other to create phasing drones. Plug in more oscillators or different outputs of one oscillator for the ultimate drone experience.

AUTO PANNING

Split your audio signal (in a mult) and connect it to Channel A IN and Channel B IN. Listen to the Channel A output as the left channel and Channel B output as the right channel. Plug an LFO into the Channel A CV input. Turn the Channel A attenuverter to the left and the Channel B attenuverter to the right to perform CV-controlled panning. Explore the different combinations of the LEVEL fader and attenuverter positions to navigate the stereo spectrum. Split your audio to all 4 channel inputs and bring in another LFO to Channel C CV input to perform quadraphonic panning (Channel A CV = left/right, Channel C CV = front/back).

ENVELOPE PANNING

Create the same patch as Auto Panning, but instead of plugging an LFO, use the built-in SIDE CHAIN envelope follower. This way you can have the loud parts of the signal in the left channel and quiet in the right. You can also have transients on the side and body in the middle etc.

FEEDBACK

Patch the MIX output to Channel A IN and listen to Channel D OUT. Plug any signals into the other inputs. Use Channel A as a feedback channel. Use the Channel A attenuverter to tame the feedback. Turn it to the left and bring up the LEVEL fader to compress the feedback and keep it at a limited level. Turn the LEVEL fader down and turn the attenuverter to the right to bring the feedback up only for the loud parts.

DEESSER (KINDA)

Plug your signal into Channel D IN, patch SPECTRAL ENV to the Channel D CV input, and listen to Channel D OUT. Set the SPECTRAL switch to TREB and turn the Channel D attenuverter to the left to compress the signal as soon as any high frequencies appear. This way, you should be able to tame some high-frequency harshness. Please note that with this patch, Aikido will compress the whole signal, not just the high frequencies.

PARALLEL COMPRESSION

Split your audio signal (in a mult) and connect it to Channel A IN and Channel B IN. Listen to the MIX output. Turn the Channel A attenuverter to the left to compress Channel A with itself. Center the Channel B attenuverter and bring up the level of Channel B to mix in the dry signal. In this way, you get parallel compression.

SPECTRAL DRUM BUS COMPRESSION

Mix your drums in Aikido and patch SPECTRAL ENV to the Channel A CV input. Play around with the attenuverters on each channel and the SPECTRAL envelope switch to get different types of spectral compression/expansion. Experiment!

MODULATION MIXING SIDE CHAIN

You can use Aikido to mix modulation signals and audio signals at the same time. Let's use Channel D and plug an LFO to the IN jack and then patch the OUT jack to a filter cutoff, for example. Run your kick drum on Channel A. Turn the Channel D attenuverter to the left and use the SLOW response of the SIDE CHAIN switch. This way, the filter will only get the LFO modulation when the kick drum is not there. Or it will act as an LFO delay/fade-in. Combine a lot of modulations in Aikido for some saturated awesomeness!

CREDITS

DEVELOPMENT TEAM

Peter Edwards, Martin Klecl, Václav Peloušek

MAIN TESTER

Juha Kivekäs

BETA TESTERS

David Žáček, Milan Říha, John Dinger, Václav Mach, Peter Edwards, Oliver Torr, Patrik Veltruský, Niels Aras, David Herzig, Leo Hivert

MANAGEMENT

John Dinger

GRAPHIC DESIGN

Anymade Studio

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

EASTEA BASTL

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AND VIDEO TUTORIALS

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