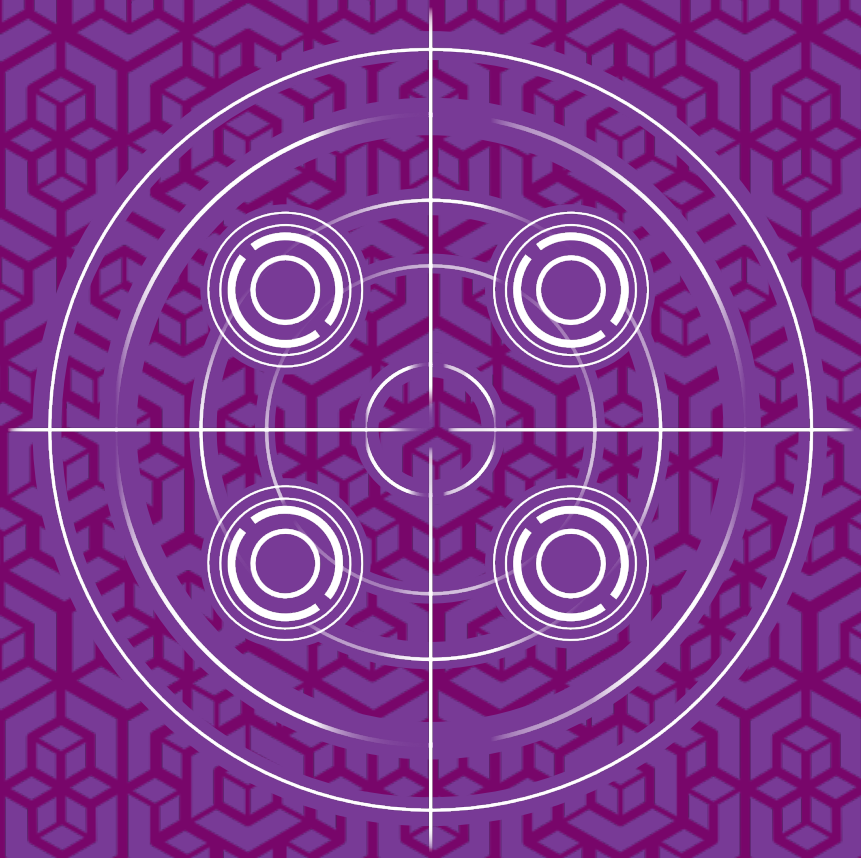
3DVCA



Quad Vector VCA

MYSTIC
circuits

Contents

3DVCA

Flexibility is what makes modular synthesis so special. Every input and output is a portal to new ways of making music. Each module that you add to your case expands the possible signal routings of the other modules in your case exponentially. 3DVCA is designed to automate these routings and give you a flexible tool to send or mix signals across your case. Designed to be a highly customisable connection matrix, 3DVCA packs a boat load of utility into a small 6HP package. Four VCAs share the three macro controls: X, Y, and Z. As a group, they shape incoming or outgoing signals and emulate the coordinates of a point in 3 dimensional space. They allow the VCAs to work together in mono, stereo, or quad configuration and accomplish a variety of mixing, crossfading, or panning functions. For easy integration with multiple 3DVCAs or other mixer modules, each VCA output has a dedicated sum input. This allows an entire mix to be automatically passed along to the next mixer in the chain. Each module is built with high quality components, Sound Semiconductor VCAs, and rail-to-rail OPA family op amps. On top of that, each VCA is fully DC coupled to work predictably with any type of signal you throw at it. Exponentially expand the routing potential of your modular system with the Mystic Circuits 3DVCA.

www.mysticcircuits.com

INSTALLATION

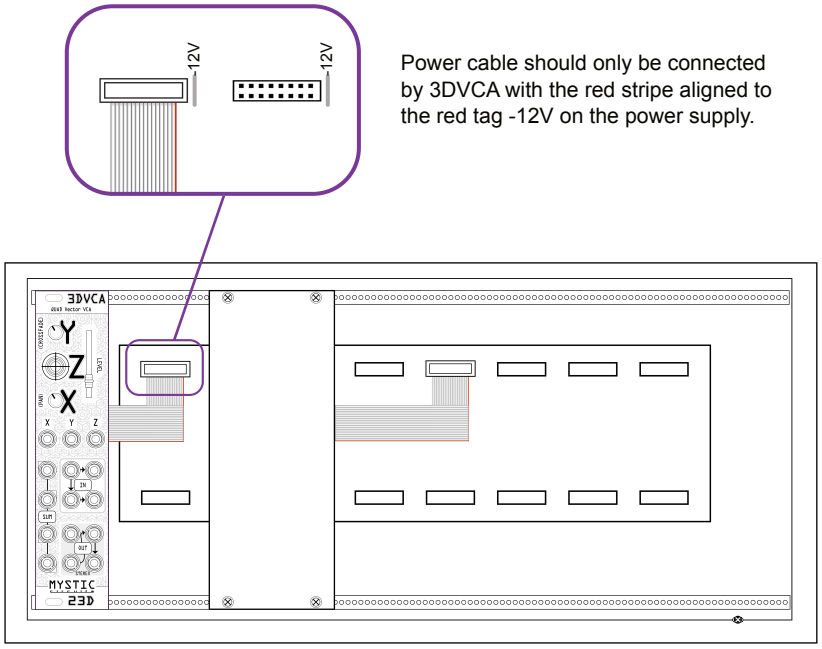
Follow the installation instructions carefully to avoid module or rack damage.

1. Ensure the power connection is off before installing the device.
2. Identify 6HP of free rack space in which to install the module.
3. Connect the 10 pin connector from the IDC ribbon power cable to the header on the rear side of the module by aligning correctly with the red stripe on the ribbon conductor nearest to the -12V pin indicator on the header.
4. Insert the cable through the rack and connect the 16 pin side of the IDC ribbon cable to the rack power supply header. Ensure that the pins are aligned correctly with the red stripe on the ribbon conductor nearest to the -12V pin on the header.
5. Position the module into the dedicated rack position.
6. Attach the 2 x M3 screws by screwing into the 2 locator holes and the rack mount taking care to not over tighten the screws.
7. Turn on the power to the rack.
8. The module will start up and be ready to use.

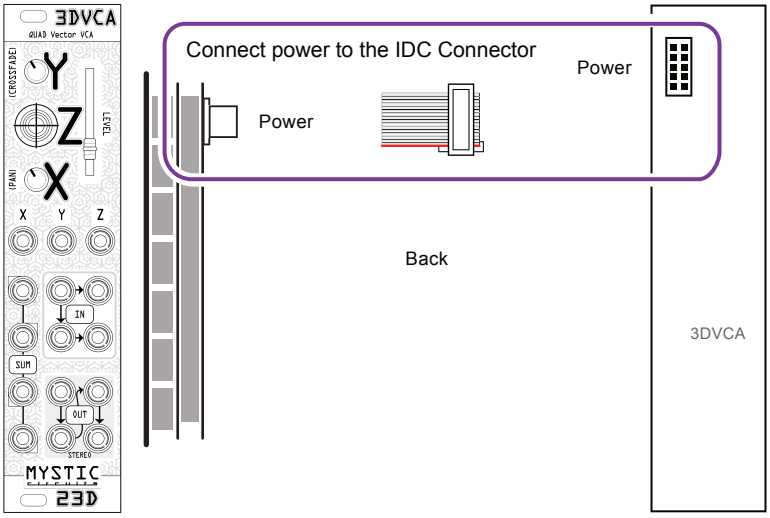
Ensure the following conditions are correct for trouble free installation.

- Rack power supply can accommodate all of the installed modules total current ratings. 3DVCA power requirements are +12V 45mA, -12V 45mA, +5V Not Used.
- 3DVCA is 30mm deep.
- Module power cable orientation is correct at both the rack and module side. Use the IDC ribbon cable supplied with the module.
- Ensure the rack earth / grounding is correct.
- Take care to avoid patch cables falling into the rack or touching module PCB’s

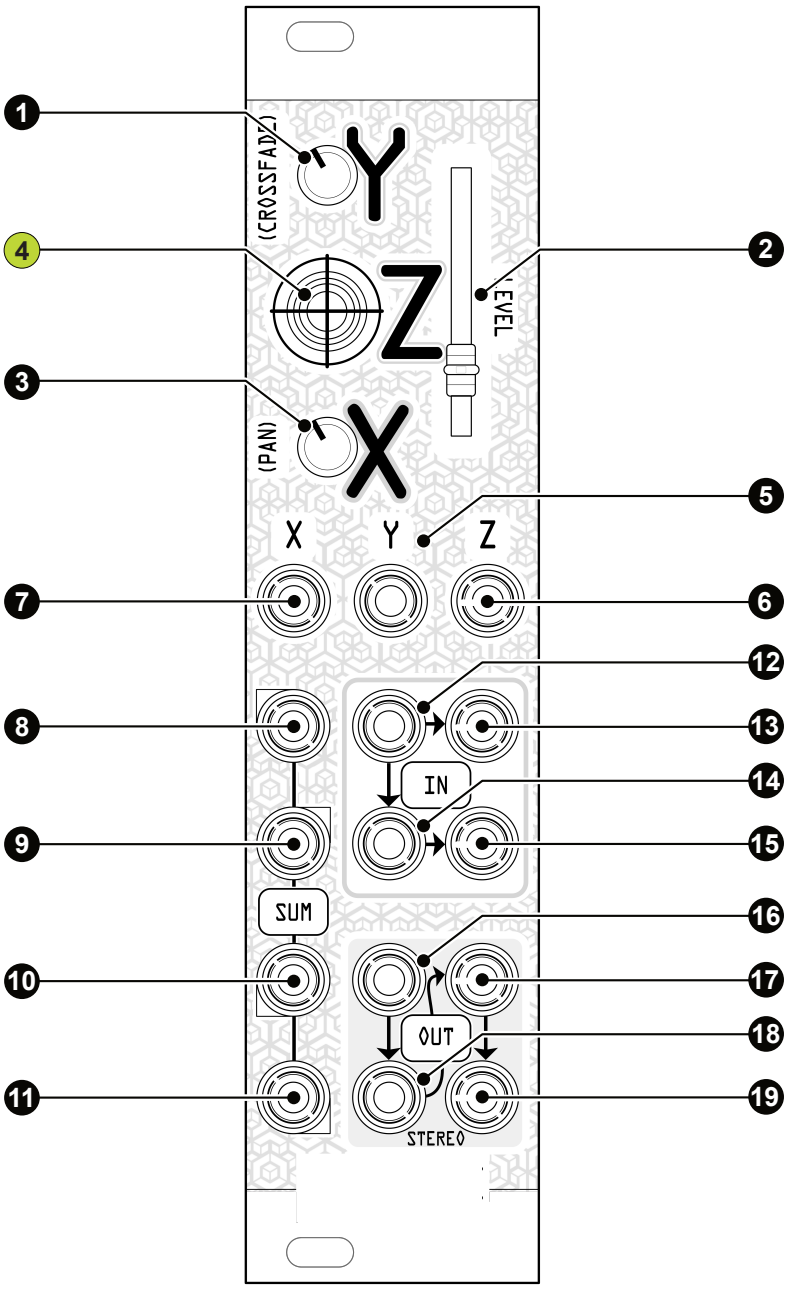
Eurorack Installation.



Power cable should only be connected by 3DVCA with the red stripe aligned to the red tag -12V on the power supply.



QUICK REFERENCE



1. Y Control. Fades Upper & Lower VCA Pairs On / Off. Crossfade in stereo configs.
2. Z Control. Turns all active 4 VCA's On - Slider Up or Off - Slider Down.
3. X Control. Fades Left & Right VCA Pairs On / Off. Pan in stereo configurations.
4. Compass. LED visualisation of the 4 VCA Channels.
5. Y CV Input. External control voltage modulation input.
6. Z CV Input. External control voltage modulation input.
7. X CV Input. External control voltage modulation input.
8. NW Sum Input. Allows an input to be summed to the North West output
9. NE Sum Input. Allows an input to be summed to the North East output
10. SW Sum Input. Allows an input to be summed to the South West output
11. SE Sum Input. Allows an input to be summed to the South East output
12. NW Input. North West positioned input, normalised to North East & South West.
13. NE Input. North East positioned VCA input.
14. SW Input. South West positioned input, normalised to South East Input.
15. SE Input. South East positioned VCA input.
16. NW Output. North West positioned output normalised to South West output.
17. NE Output. North East positioned output normalised to South East output.
18. SW Output. South West positioned output normalised to North East output.
19. SE Output. South East positioned VCA output.

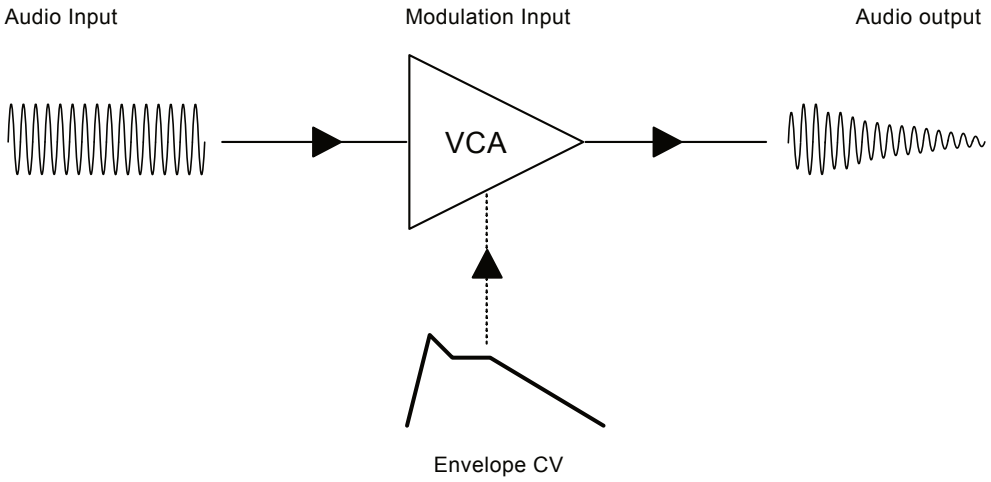
The VCA Input / Outputs can be used in Mono, Stereo or Quad configurations. Arrows on the panel indicate the normalization structure. Normalization is only performed when a destination jack socket is unplugged.

FUNCTIONAL OVERVIEW

Basics of a VCA.

A VCA (Voltage Controlled Amplifier) is a device that takes a voltage signal at the input and adjusts the output level of that signal according to the level of a control voltage. This function can be thought of as a voltage controlled attenuator. VCAs have the ability to switch a signal on or off completely when controlled with a gate or gradually fade the amplitude of that signal with a gradually changing control voltage. The most common use of a VCA is to use an envelope to control the volume of an audio source in order to turn a constant tone into more musical notes. In general, VCAs have a myriad of uses ranging from adjusting the amount of modulation going to different control voltage inputs, changing the volume of different notes in a sequence to allow accents or ghost notes, muting voltage connections between different modules under voltage control, and so many other functions. VCAs are probably the most important module in your system aside from audio and CV signal generators.

Example: Generic VCA Principles



Mystic Circuits 3DVCA - Quad Vector VCA.

Mystic Circuits 3DVCA is a quad VCA in a small 6HP form factor that can operate in mono, stereo or quad configurations. Unlike a traditional quad VCA which allows independent control over each VCA, 3DVCA uses 3 dimensional macro parameters to control all 4 VCA channels together as a group. The X function gradually attenuates the Left / Right pairs of VCA channels, the Y Function attenuates the Upper / Lower pairs of VCA channels and the Z function controls the level of all active VCAs determined by the module's X and Y settings.

The four VCA inputs and outputs are configured in a four quadrant configuration similar to a geographic compass. As such, the 3DVCA LED display is called the ‘Compass’ and visually represents the activity of all four VCAs. Similarly, the VCA inputs and outputs are referred to as their corresponding North, East, South, and West positions. This will be described in greater detail later in the manual.

3 DIMENSIONS OF CONTROL

Instead of having control over each VCA individually, 3DVCA uses three Macro controls to control all four VCAs as a group. This paradigm not only allows 3DVCA to be compact, but also performs a variety of functions that benefit from using the VCAs in tandem. Input and output normalization make it easy to send one signal to multiple inputs or mix multiple VCA outputs together in versatile ways.
The main parameters ‘X’, ‘Y,’ and ‘Z’ control the activity and overall level of the four VCAs as if they behaved like a point in 3-dimensional space. Think of ‘X’ and ‘Y’ as controls over the orientation of the point and ‘Z’ as the control over the distance. Although 3DVCA can be patched in a variety of ways to change how it processes signals, these controls will always work the same.

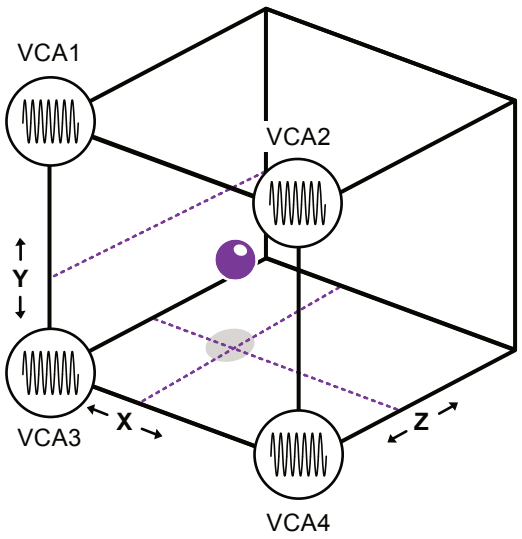
‘X’ gradually turns on or off the left and right pairs of VCAs.

‘Y’ gradually turns on or off the top and bottom pairs of VCAs.

‘Z’ changes the overall level of whichever VCAs are active depending on the ‘X’ and ‘Y’ settings.

With both ‘X’ and ‘Y’ in their center positions, all four VCAs will be active. From there you can activate or deactivate any adjacent pair of VCAs or have only one of the four VCAs active by adjusting ‘X’ and ‘Y.’ The current activity of all four VCAs is displayed in the circular “compass” window between the ‘X’ and ‘Y’ knobs.

3 Dimensional Control Concept

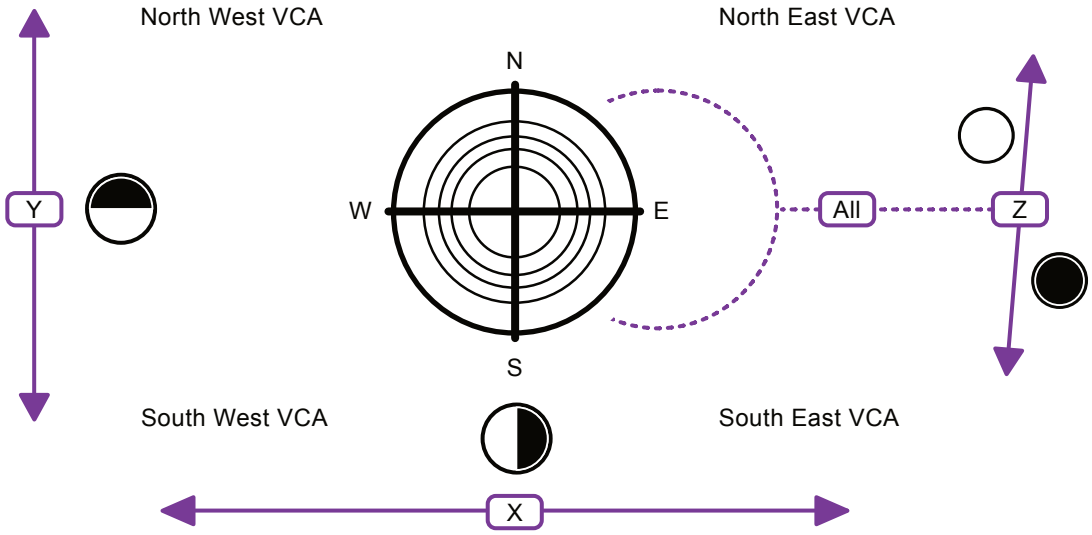


Control Point

COMPASS DISPLAY

The ‘Compass’ is the name given to the LED circular indicator that displays the status of the four VCA’s. Each quadrant of the Compass represent the activity of one of the four VCAs with a fully active VCA being fully illuminated and a fully inactive VCA being dark. As mentioned before each VCA is denominated with an intercardinal direction which corresponds to their direction on the compass: North West, North East, South East and South West. The input and output position of each VCA will also correspond to their assigned compass direction. Using either the panel controls or incoming modulation CV determines the overall activity of all four VCAs.

LED Indicator Compass

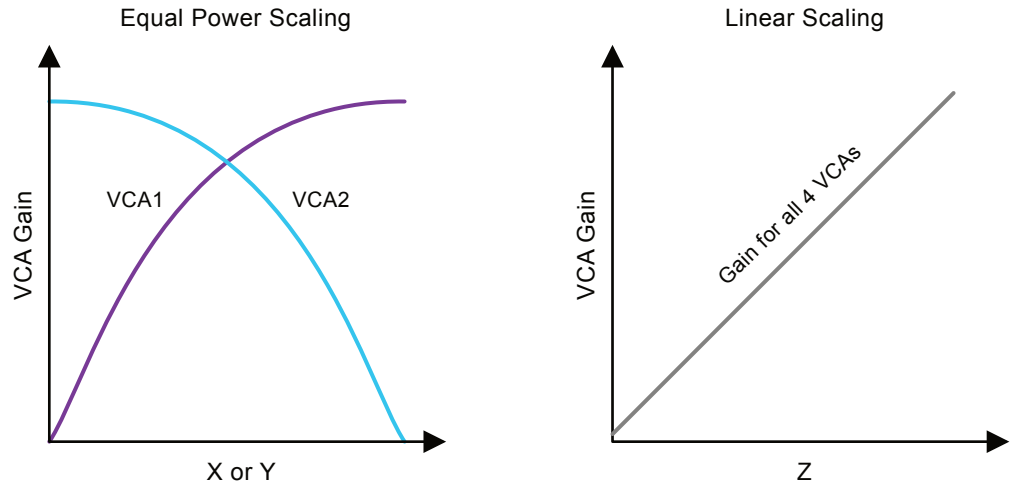


	Manual	CV In	Description
X	Knob	+/-10V	Fades on / off control for the East and West side VCA pairs. The left and right channels of the will be balanced when set in a stereo configuration and pan the input left and right in Mono. The Panning feature is common to all VCA’s. The range -10v to +10V is relative to the control knob. Full 10V is needed if control is at the minimum position but +/-5V signal will cover the full range if the knob is set at midpoint.
Y	Knob	+/-10V	Fades on / off control for the North and South VCA pairs. In a standard stereo configuration the control will crossfade between the two stereo sources. Full 10V is needed if control is at the minimum position but +/-5V signal will cover the full range if the knob is set at midpoint.
Z	Slider	0-5V	Fades on / off control for all VCA’s simultaneously. This function is still reliant on the X and Y controls determining the active VCA’s. A 0-5V signal will sweep through full range.

SCALING CURVES

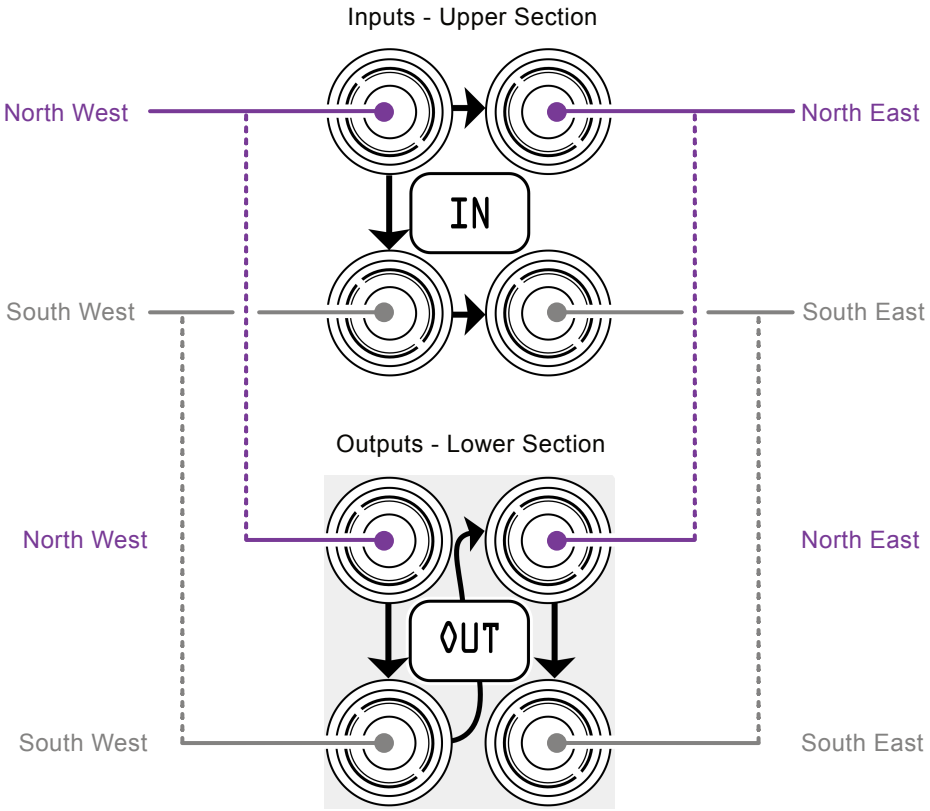
Both the ‘X’ and ‘Y’ controls use an “equal power distribution” in order to keep the volume of all of the inputs roughly the same when mixing many signals together or when only hearing one output. This means that whenever multiple VCAs are active, there will be a volume drop for any currently audible signals to compensate for the extra volume that normally comes when mixing various signals together. In contrast the ‘Z’ parameter uses a “linear power distribution” so that the overall volume of any currently audible signals will track linearly with an incoming CV signal. This makes it easy to predict how a CV is going to affect the level, but it comes with a downside: human hearing is actually logarithmic. This means that the difference in volume will be more noticeable towards the bottom of the ‘Z’ slider rather than towards the top. This makes it seem like the volume turns up fast when coming in from silent. We decided that it was more important to use a linear control here than to have the volume change seem constant because it is much easier to use an exponential envelope than it is to try and scale incoming CV to cancel out an exponent; offering both as an option simply wasn’t possible due to space constraints. If you did not understand this paragraph, don’t worry! It isn’t terribly important to the functioning of the module, but it is still important to have access to this information.

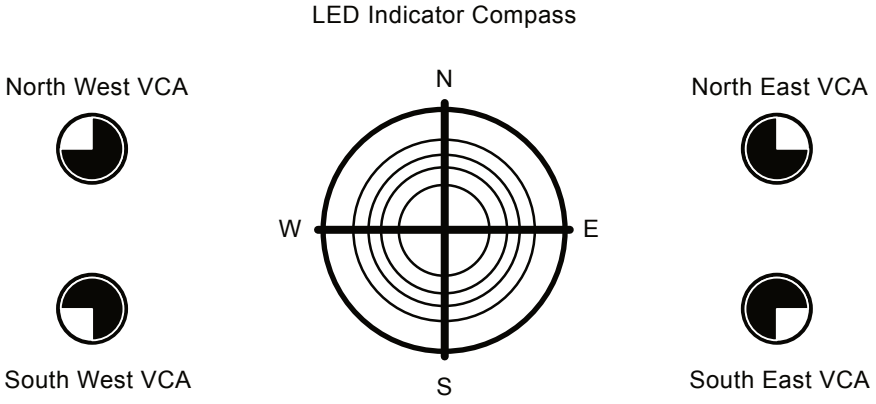
Scaling Examples



INPUTS & OUTPUTS

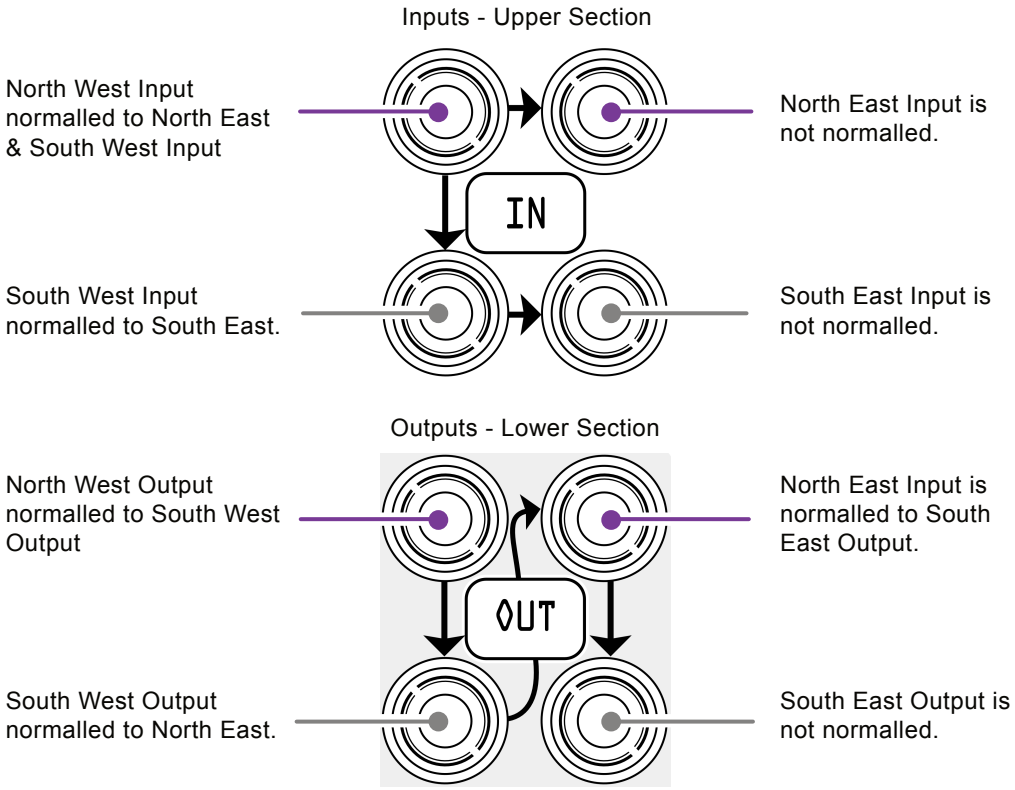
On the front panel, you will see two squares of jacks labeled with “IN” and “OUT” in their respective centers. This is where you access the four VCAs. Each corner of each square is connected through their respective VCAs and is reflected by its position in the compass window. Similar to a compass, we will be referring to these VCAs as compass directions: the top left VCA is “North West”, the top right VCA is “North East”, the bottom right is “South East” and the bottom left is “South West”. Similarly, any pair of VCAs can be referred to by the cardinal directions of a compass; the top pair of VCAs are the “North” VCAs, the bottom VCAs are the “South” VCAs, etc. This saves our fingers from having to type “top left” a million times and is also a useful nomenclature that fits in with the compass metaphor of our display.





NORMALIZATION ROUTING

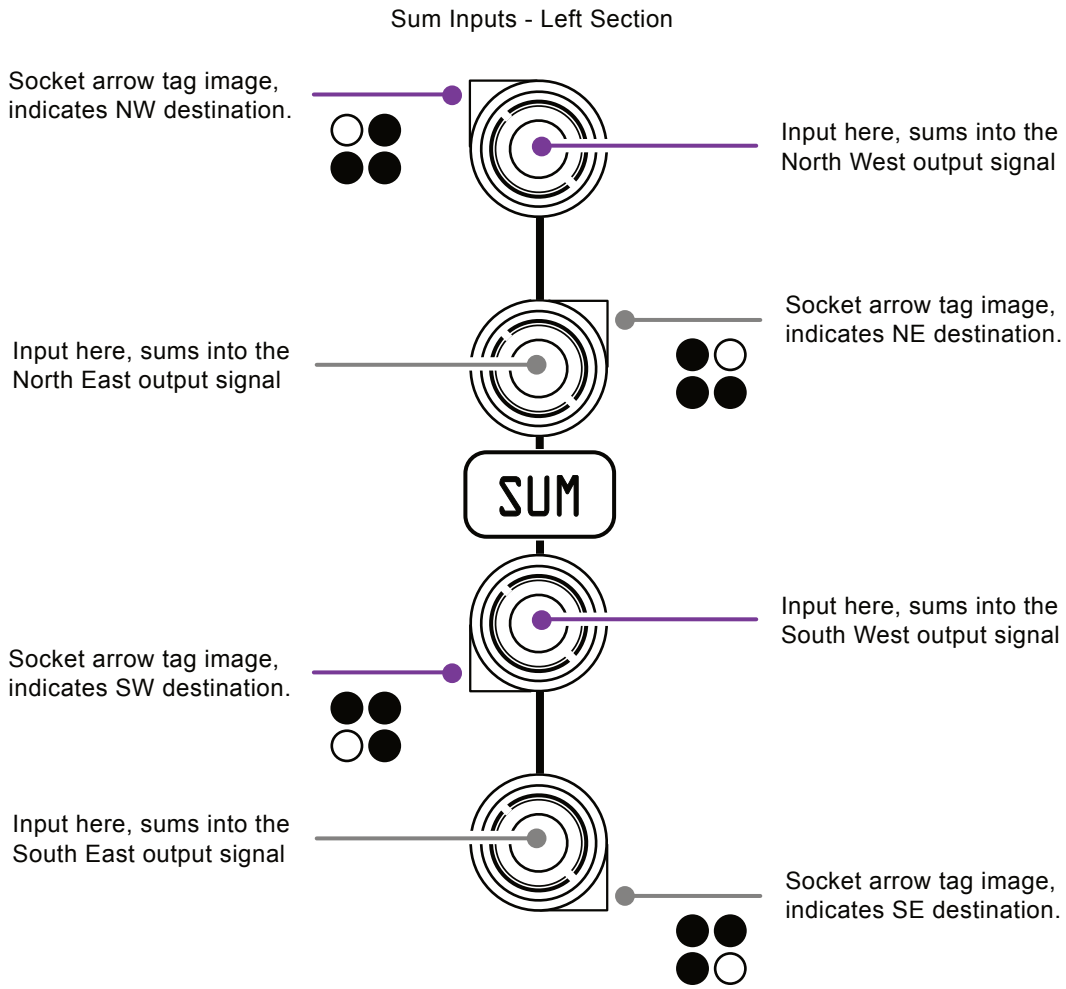
The normalization pattern of the input and output jacks is notated on the panel using arrows going between the various jacks. For those that don't know, a normalized jack will make a dedicated connection to another jack when nothing is plugged into it—that means that you can distribute or mix a signal across multiple jacks without needing any external modules. For example, when nothing is plugged into the NE input, it will borrow its input signal from whatever is plugged into the NW input. This is marked by an arrow pointing from the NW input jack towards the NE input jack. In contrast, if you to plug a signal into the NE input jack, it will break the normalization connection and then the arrow and NW input signal is ignored at the NE VCA input. This is where the true power of 3DVCA resides: these normalization connections allow you to use 3DVCA in a multitude of different functions without needing to use a large number of external mults or mixers.



The normalization pattern is different between the input and output squares—this pattern was picked in order to make stereo patching more intuitive. When using the module in stereo, you can usually treat the left and right inputs or outputs as left and right channels of your stereo signal. If you want to mix two stereo signals together in this paradigm, then we want the outputs to mix downwards with the NW output mixing into the SW output and the NE output mixing into the SE output. In contrast, if you have a mono signal that you want to use in stereo patches, then the signal must be distributed from left to right to share both sides of either the Northern or Southern VCA pairs. This normalization scheme also lets you use the module in mono by distributing the NW input to all four VCA inputs and mixing all four VCA outputs into the SE output.

SUMMING

The final feature to explore on 3DVCA is the group of “SUM” inputs located on the left of the panel. Each of these inputs mixes automatically into its dedicated VCA output with the direction of the VCA labeled as a white square pointing away from the jack that it identifies. The sum inputs add a lot of utility to the module, allowing an entire mix to be made in mono, stereo, or quad just by daisy chaining multiple 3VCAs together and even allow the module to play nicely with other mixer modules by adding their output to your 3DVCA’s mix effortlessly. When using 3DVCA in mono and listening to the SE output mixing all four VCA outputs together, this section of the module functions as a four channel unity mixer (essentially mixing 8 signals together with voltage control over four of those signals.) When using 3DVCA in stereo, this section can mix in two other stereo pairs to tie your whole patch together. When working in quad, each output of 3DVCA can be patched into the sum inputs of the next 3DVCA in the chain, allowing 3DVCA to mix an entire quad patch together with no other modules needed.



Summing occurs pre-normalization so the full mix is also normalled at the output destination. Only signals plugged into the VCA inputs can be attenuated by 3DVCA (manually or with CV). Signals patched into the SUM inputs will be heard at their incoming levels

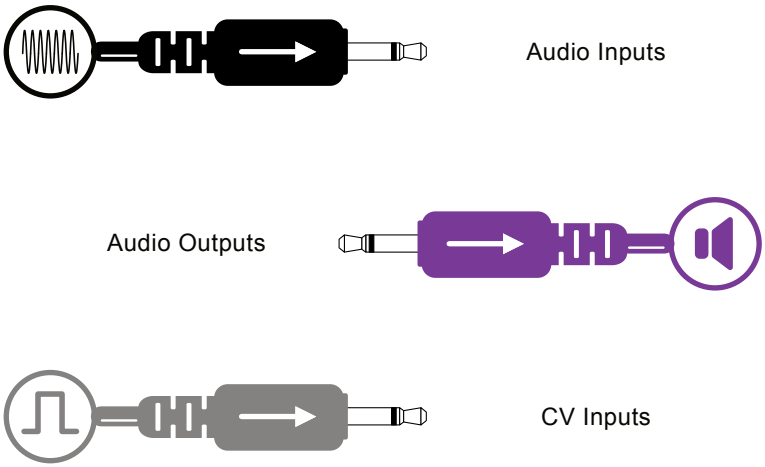
PATCHING EXAMPLES WITH 3DVCA

In the following section of the manual we will be showing a few examples of how to use 3DVCA in a patch. These examples will show some ways that we pictured 3DVCA in use when designing the module. The following patches are meant to be building blocks to inspire creative uses for 3DVCA in your synthesizer that you might find yourself coming back to often but are in no way comprehensive.

The examples to come are split into four different sections: patching in mono, patching in stereo, patching in quad, and patching with control voltages. As you become more familiar with 3DVCA, you might find that you want to use a mono source in a stereo patch, use stereo patching techniques to treat mono sources in parallel, or use one section of 3DVCA for audio and another for control voltages. Having a solid understanding of the upcoming example patches will give you the confidence to approach these more complex functions without getting lost in the details.

3DVCA is built with flexibility in mind. This is why we gave the parameters abstract labels like ‘X’, ‘Y’, and ‘Z’ instead of hard and fast labels that describe their function in every scenario. While there are small labels next to each control which describe their suggested function, the effect that each knob has on your signals will change depending on how everything is patched. Therefore the function of these knobs, the ideal input or output to use for a given purpose, and even the orientation to think of the signals flowing through the module is not the same in every patch.

The symbols used below will be used to designate certain kinds of signals in the upcoming examples:

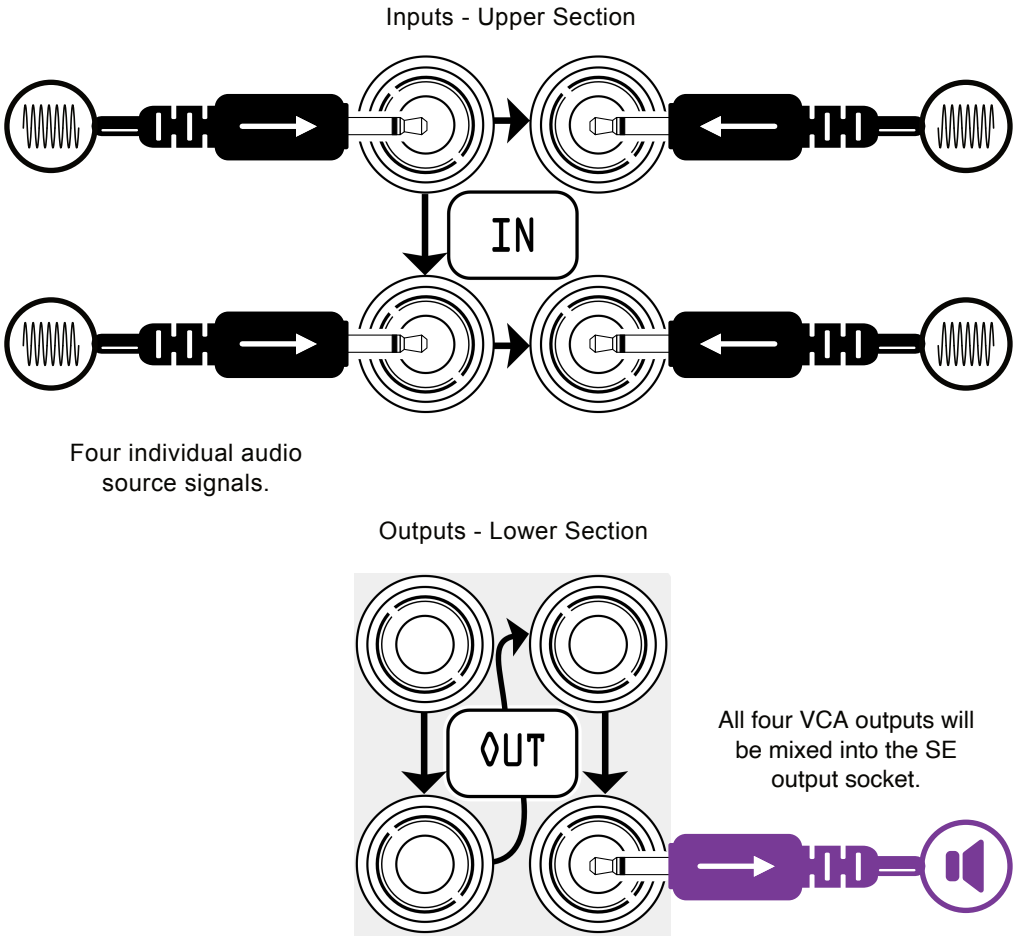


All input and output jacks use a 1/8th / 3.5mm Mono jack plug. All Inputs and Outputs are DC coupled which allows a full spectrum of unfettered sound frequencies and is therefore more accommodating when using control voltages, sequences and audio signals.

MONO PATCHING WITH 3DVCA

Patch Example 1: Crossfading between 4 Inputs

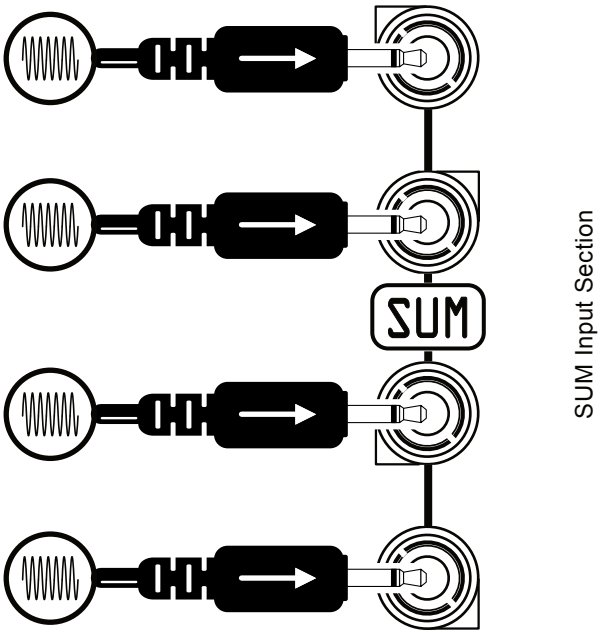
A good place to start with 3DVCA is mixing four signals together in mono. We start by taking four audio signals from your favorite audio sources, plugging them into the four VCA inputs, and then taking our output from the SE output. With both ‘X’ and ‘Y’ in their middle positions, turning ‘Z’ up or down will turn on or off the entire mix of all four signals. Turning ‘Y’ up or down from this position will gently mix in or out the North or South pairs of VCAs, while turning up or down ‘X’ from this position will do the same for the East and West pairs of VCAs. Turning both ‘X’ and ‘Y’ completely up or down will allow us to pick out each of these signals individually. Here, each combination of ‘X’ and ‘Y’ set to either their minimum or maximum settings selects which corner you are isolating. You will notice that when only one VCA is active, its signal gets a bit of a volume boost. But when you mix multiple signals together, the volume is reduced. This is the “equal power distribution” we discussed earlier at work—it makes sure that there are no significant volume jumps no matter where in the VCA compass we are.

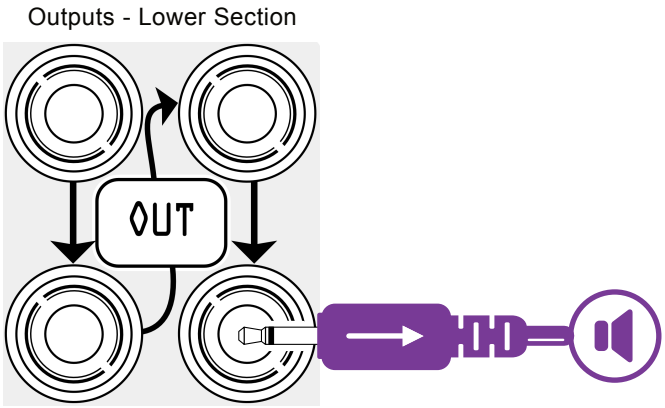


X - Left / Right Crossfade | Y - Top / Bottom Crossfade
Z - Overall Level

Patch Example 2: Unity Mixer - 4 Sum Inputs to 1 Output

As mentioned before, in this patch we can also mix in four external signals into the “SUM” inputs and have these signals mixed into our SE output. These inputs do not react to the panel controls and so there should be no difference in volume when plugging into one “SUM” input or another. This also means that there is not an easy way to mute this audio unless it has an external volume control. It’s better to use the “SUM” inputs for signals that have their own envelope, VCA, or volume control built in and to use signals that need their volume shaped into the VCA inputs to take full advantage of each section of 3DVCA.

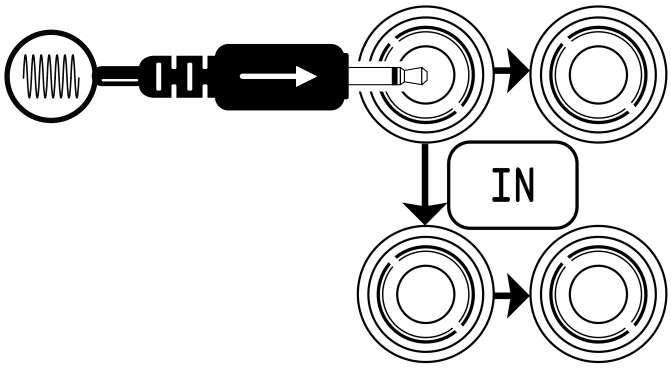




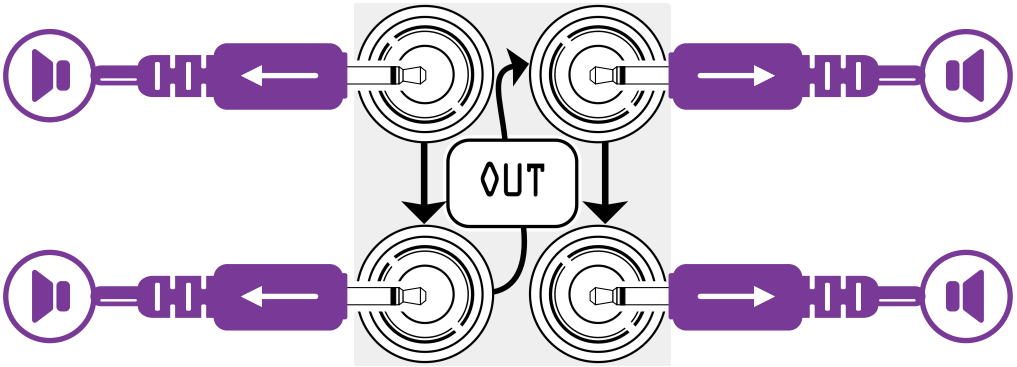
Patch Example 3: Quad Panner - Pan 1 Input to 4 Outputs

A similar patch involves sending one signal to all four of 3DVCAs outputs. Start by plugging your favorite signal generator into the NW input on 3DVCA and then plug all four outputs of the output square into different destinations: either different effects, modulation inputs, or wherever you might want to send a signal. As you can see from the input normalization arrows, this NW input signal is now shared across all four of the VCA inputs. Now the panel controls will function just as before but instead of controlling the input signal levels, we are controlling the output signal levels. And like before, the overall volume will be reduced when more than one VCA is active compared to when only one VCA is active due again to the “equal power distribution.” We will examine using this same patch to work in quad later in the manual.

Inputs - Upper Section



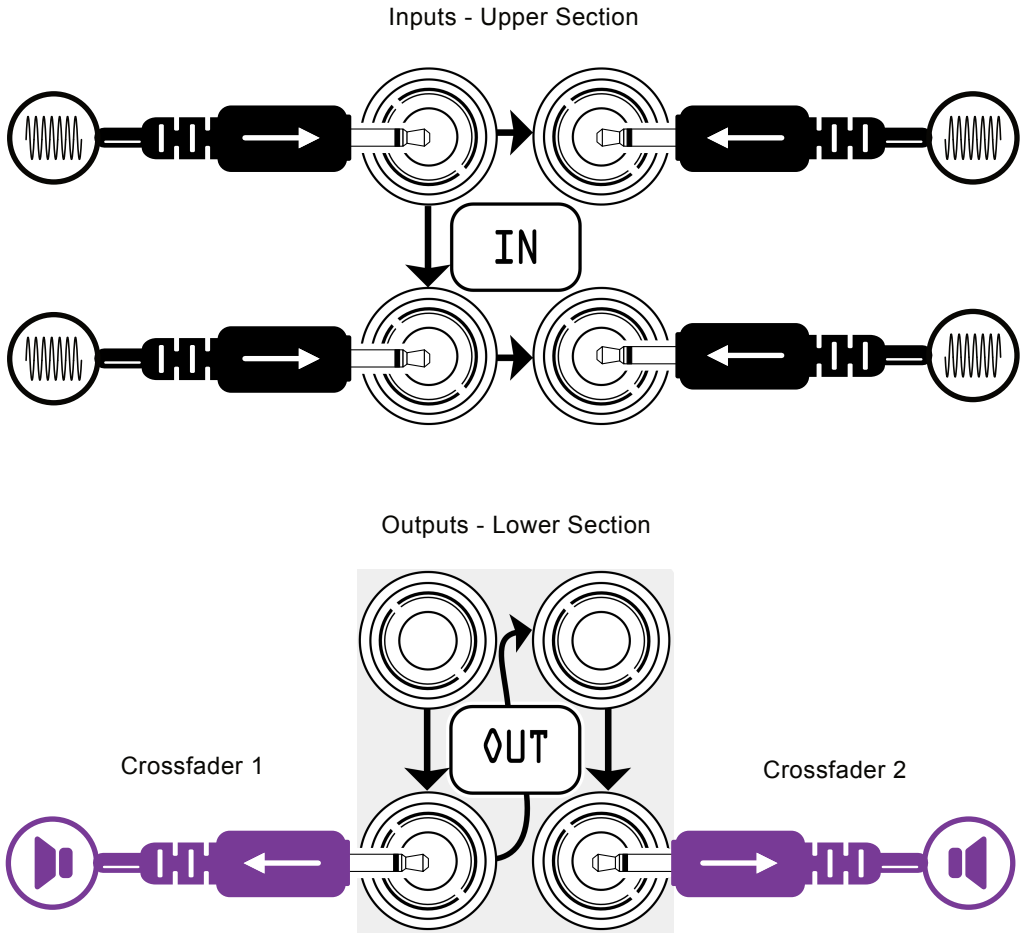
Outputs - Lower Section



X - Left / Right Pan | Y - Top / Bottom Pan
Z - Overall Level

Patch Example 4: Dual Crossfader

This patch shows an example of using different sections of 3DVCA for different purposes. You might have two waveforms from an oscillator, two outputs of a filter, two outputs of a waveshaper, or a clean and dry signal from an effect that you want to be able to crossfade between. In all of these cases you will only be using one half of 3DVCA's inputs and outputs (two inputs and one output) which leaves the other half to be used as a second parallel crossfader. While you can't set the crossfade values independently it is still useful in many cases to be able to use two crossfaders in tandem. The patch below shows you how to accomplish this.

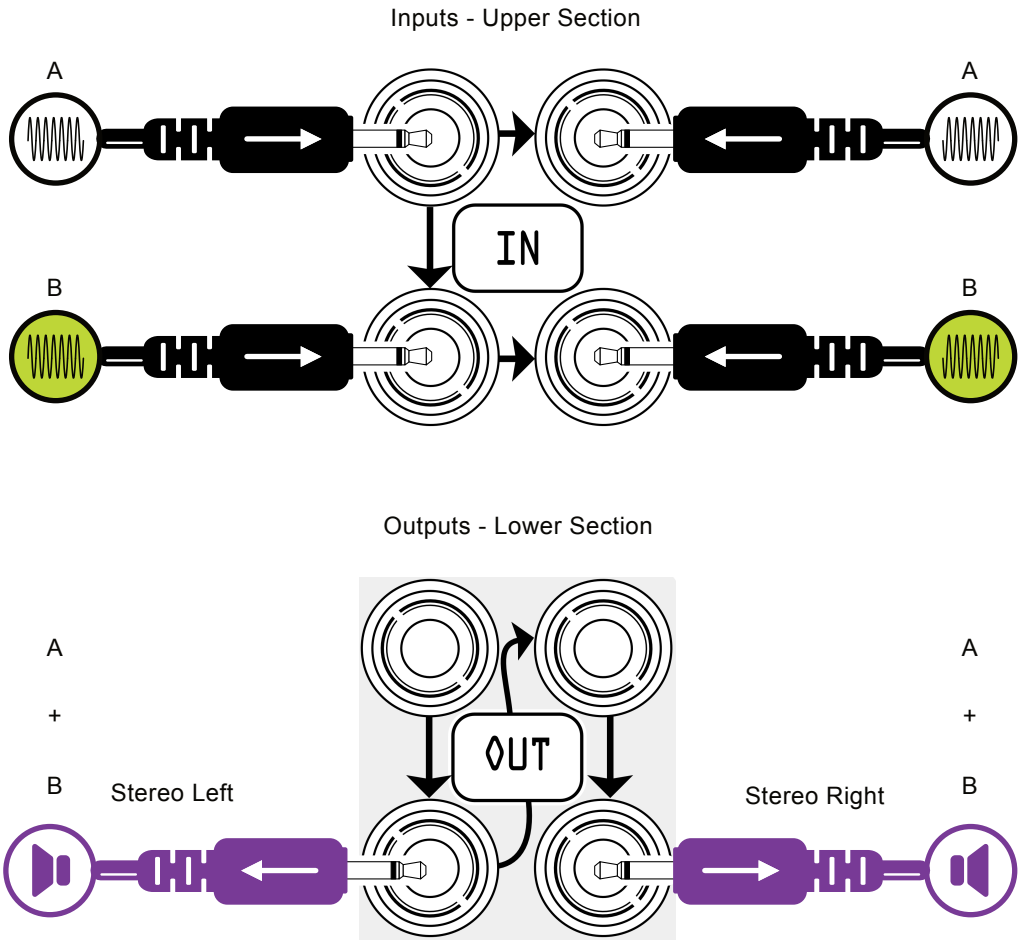


X - Left / Right Level | Y - Top / Bottom Crossfade
Z - Overall Level

STEREO PATCHING WITH 3DVCA

Patch Example 5: Standard 2 Input Stereo Channel

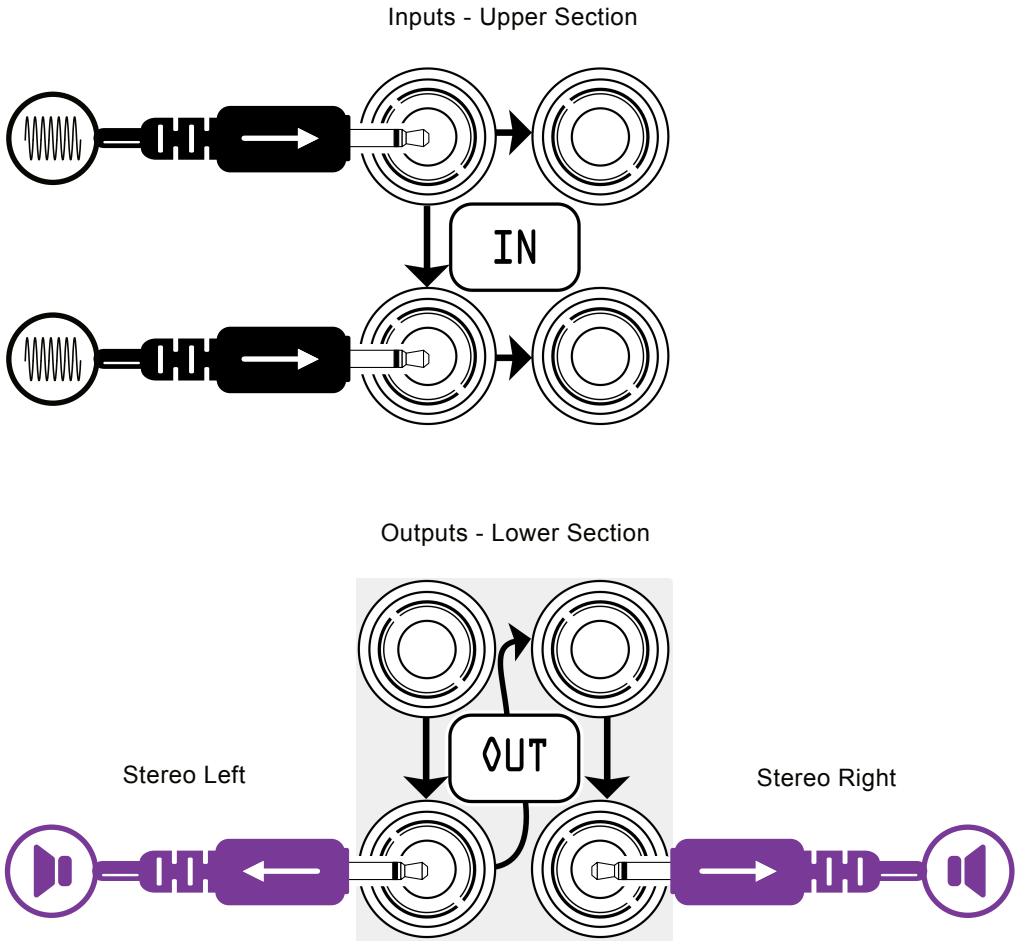
Using 3DVCA in a stereo context is where this module really shines. When using the standard stereo patch shown below, you are able to crossfade two stereo inputs, set the balance between left and right channels, and control the overall level of the results all with voltage control. Anticipating that this would be the most common way to use 3DVCA, we labeled ‘X’, ‘Y’ and ‘Z’ with the functions ‘pan’, ‘crossfade’ and ‘level’ respectively. These panel controls are merely suggestions and in other patches they may not apply accurately to the function of the controls



X - Left / Right Balance | Y - Top / Bottom Crossfade
Z - Overall Level

Patch Example 6: Mono to Stereo Crossfader & Panner

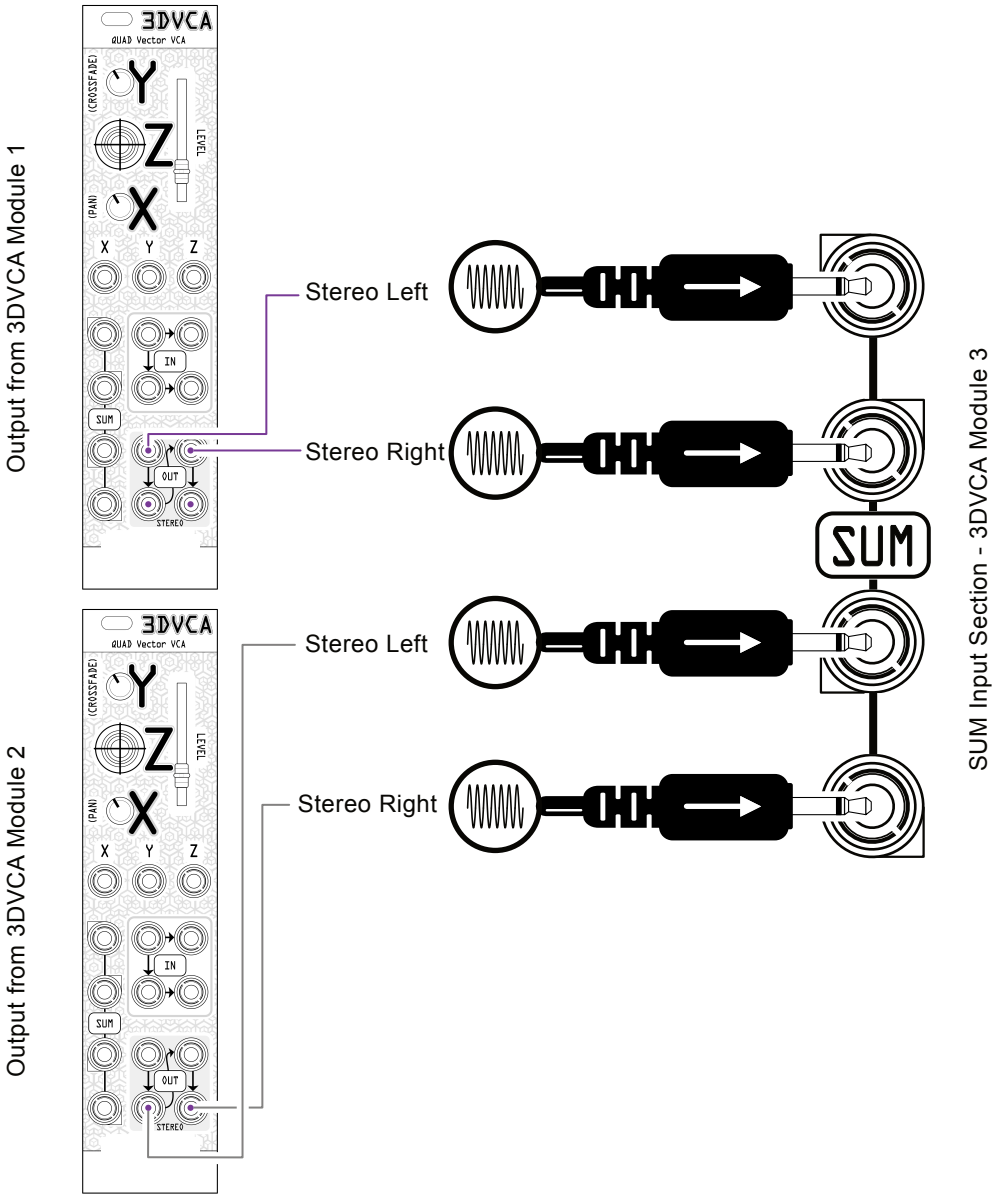
3DVCA makes it easy to use mono signals in a stereo context. Any time you want to distribute a mono signal into two of the VCAs on 3DVCA you can simply patch your mono signal into the western input on a row and that signal will automatically be distributed across to the eastern input for that row. This will allow you to pan your mono input across the left and right outputs just like a stereo input. This technique will also allow you to combine a panned mono signal with a second stereo signal.



X - Left / Right Pan | Y - Top / Bottom Crossfade
Z - Overall Level

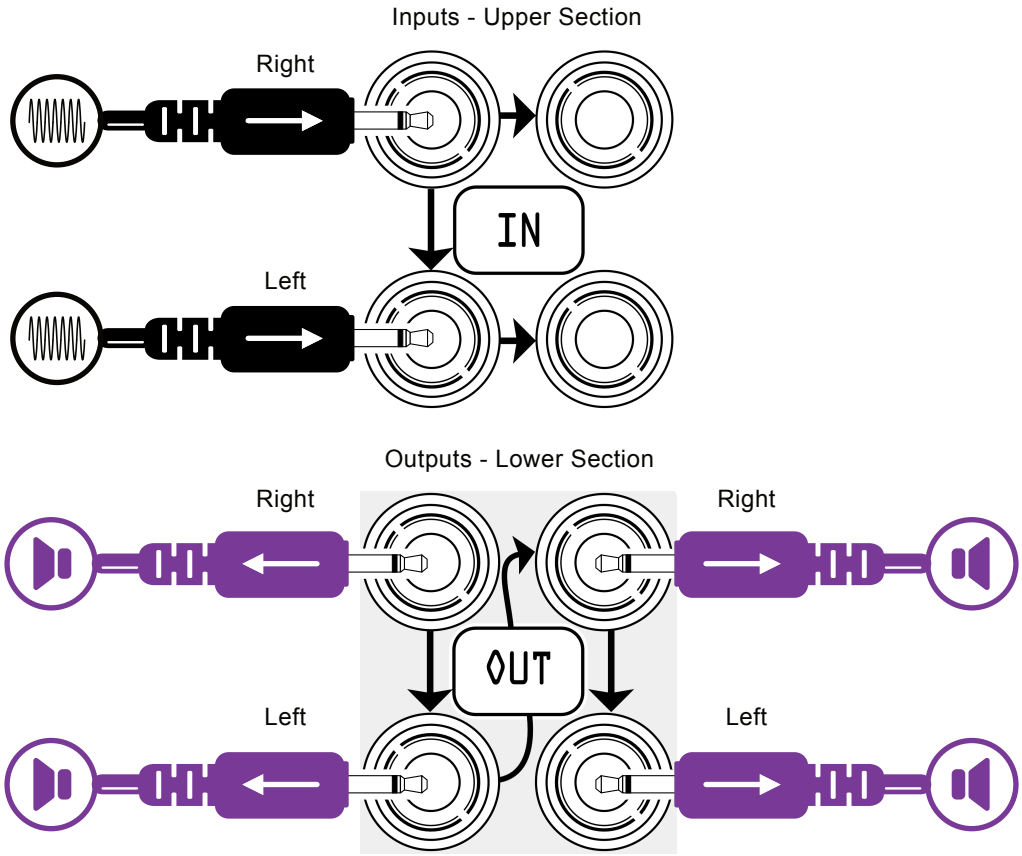
Patch Example 7: Daisy Chaining Multiple Stereo Mixers

If you have another stereo mixer or another 3DVCA, you can now plug the stereo outputs of your other module into the “SUM” inputs of your main 3DVCA with the left channel going into the SW SUM input and the right channel going into the SE SUM input. Now the output of your other mixer module will be automatically mixed into the overall mix coming out of the two outputs of 3DVCA with its stereo image intact. You can plug another stereo signal into the North SUM inputs as well, giving you the ability to mix four stereo signal pairs together with voltage control over two of those pairs using a single 3DVCA. Keep in mind that unlike the input jacks, the SUM jacks have no input normalization. So if you want to distribute a mono signal to more than one SUM input, you will need an external mult.



Patch Example 8: Stereo Distributor

Due to the normalization pattern of the inputs and outputs, if you want to send one stereo signal to two destinations, you must ignore the left/right orientation of the inputs and outputs. Plugging the left channel of your stereo source into the SW input and the right channel into the NW input will distribute these signals across to the East VCA inputs. Then we can take each of the stereo outputs with the left channels coming from the South outputs and our right channels coming from the North outputs. In this configuration, the 'X' and 'Y' labels will reverse in function with 'Y' now controlling the panning/balance, 'X' selects which of the two stereo outputs are active, and 'Z' controls the overall volume. This is one of the reasons that we named our parameters something abstract like XYZ instead of giving them hard and fast definitions: these controls change their function depending on how 3DVCA is patched, even if they quite often do what they say on the label. If you really want to keep the same control scheme as before in this patch you can do so by patching the left channel of your stereo input signal into the NW input and then use an external mult to patch the right channel into both the NE and SE inputs, as seen from the normalization pattern the NE input will grab it's signal from the NW input. Then the two stereo outputs can be taken from the North outputs and South outputs respectively.



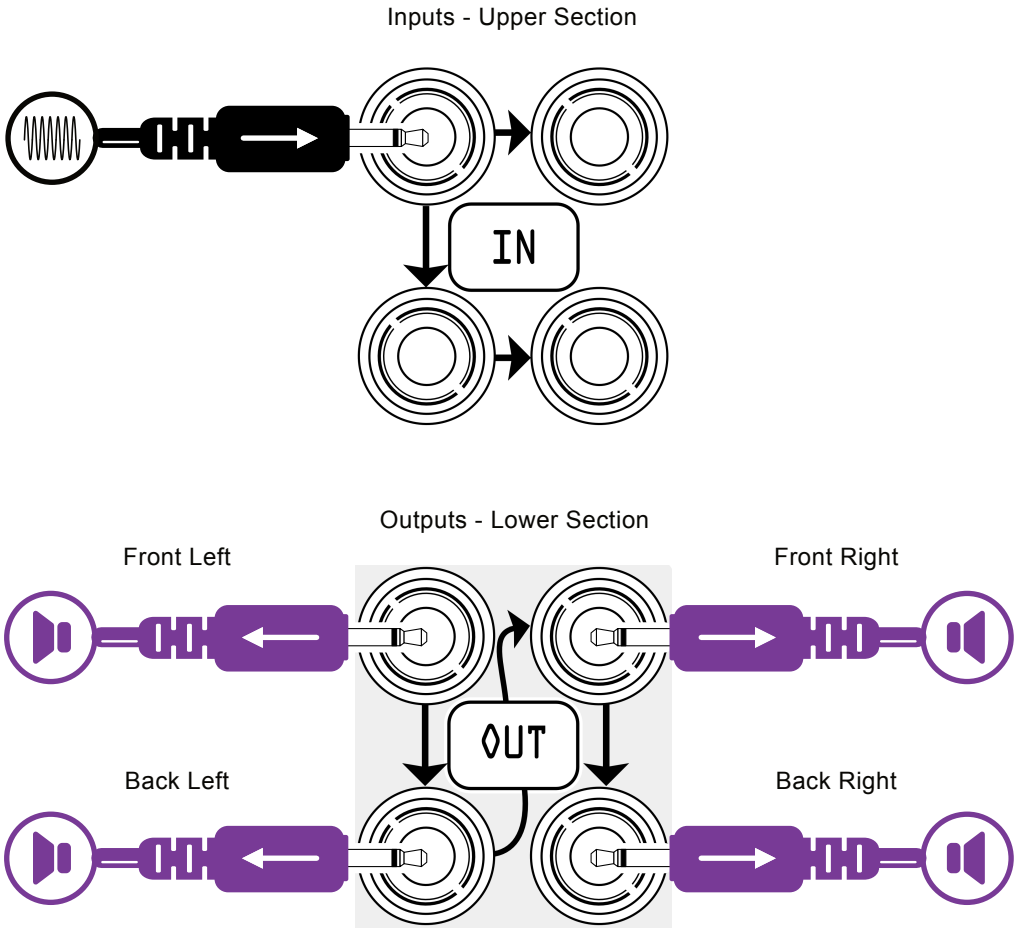
X - Select Destination 1 or 2 | Y - Pan L/R
Z - Overall Level

QUAD PATCHING WITH 3DVCA

Patch Example 9: Quad Panner

For an important minority of users, the most exciting part of 3DVCA will be working with it in quad. For those that don't know, quad refers to making music with four unique channels instead of the standard two channels used in stereo. Instead of just making music for your left and right ears, you can make music that goes all the way around your listening vantage point—this creates a rudimentary surround sound.

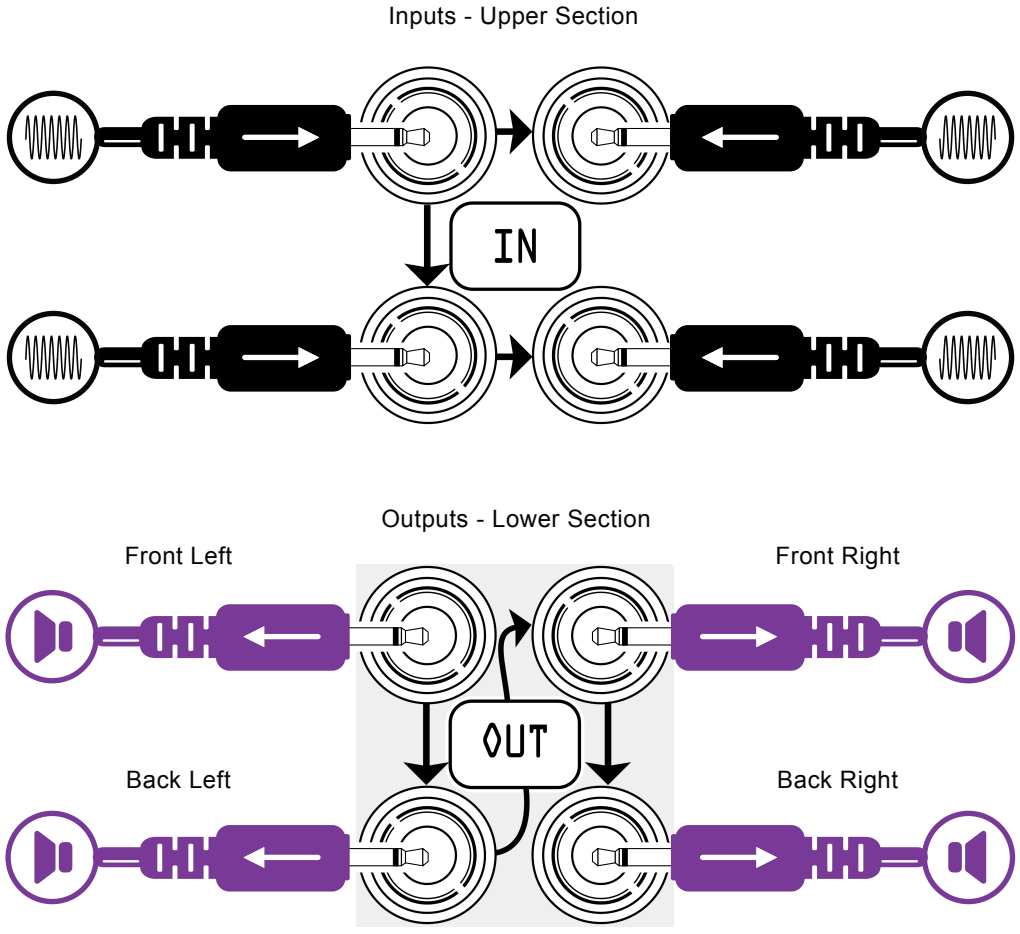
We have already presented a patch for sending a mono signal to four destinations in the mono section of this manual: your input signal goes into the NW input and then you grab our four output signals from each of the VCA outputs. Previously in the mono version of this patch, this technique sent a signal to four different destinations. When patching in quad, your four destinations are simply four different speakers.



X - Left / Right | Y - Front / Back
Z - Overall Level

Patch Example 10: Quad Balancer

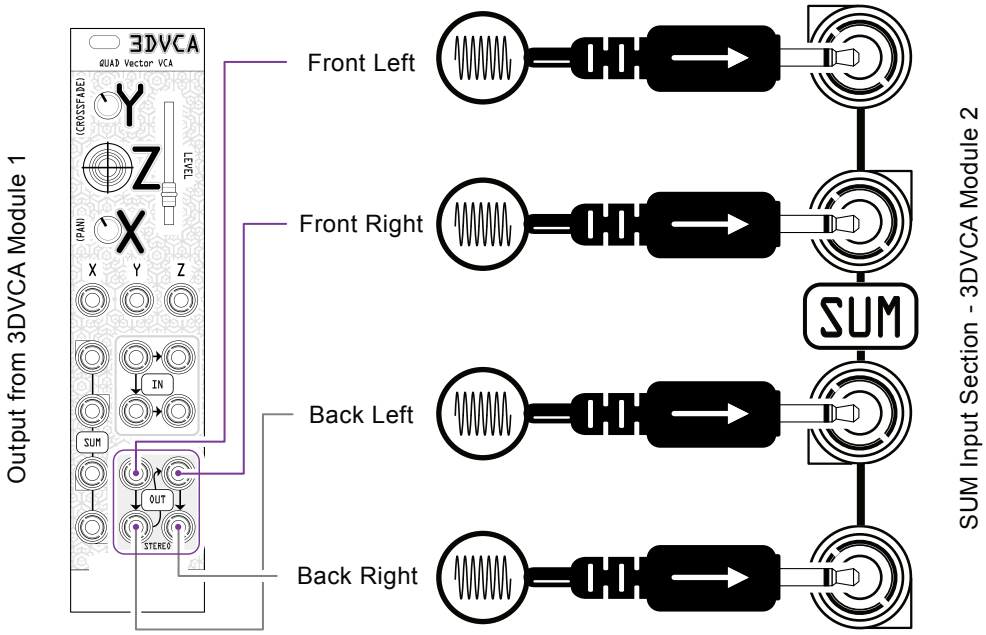
If your audio is already mixed in quad, then you are in luck! 3DVCA can process this audio similarly to the patch mentioned earlier if you plug each channel of your quad signal group into the four VCA inputs and take your quad output from the four VCA outputs. You can then control the balance of the four channels as well as the overall volume using the 'X', 'Y', and 'Z' controls. When working this way it is important to keep the orientation of your quad signals the same across your modular if you want to predictably orient your sound. We suggest using the following assignment of your four signals: front left is NW, front right is NE, back left is SW, back right is SE. Avoid crossing the streams in your quad setup to prevent annoying confusion when trying to send a signal to specific places.

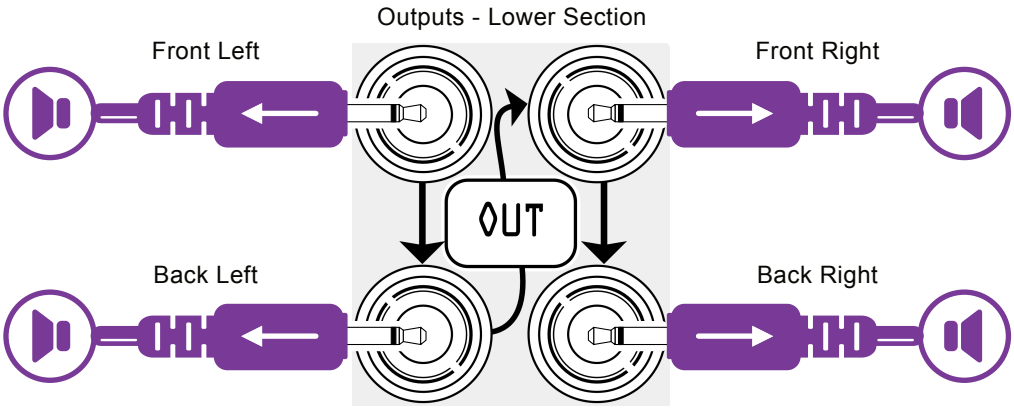


X - Left / Right | Y - Front / Back
Z - Overall Level

Patch Example 11: Daisy Chaining Quad Mixers

A final note on quad usage is that 3DVCA can daisy chain to other 3DVCAs to mix multiple quad audio streams together without needing any other mixer modules. Simply plug the four outputs of 3DVCA into the matching SUM inputs of the next 3DVCA in the chain and your four signals will be mixed all the way down the chain until it finally reaches your output module. If you have other mixer modules that are designed to work in quad, you can easily integrate them into this setup either by patching their outputs into the first 3DVCA in the chain or by patching the outputs of the last 3DVCA in the chain into the inputs of your other quad mixer.

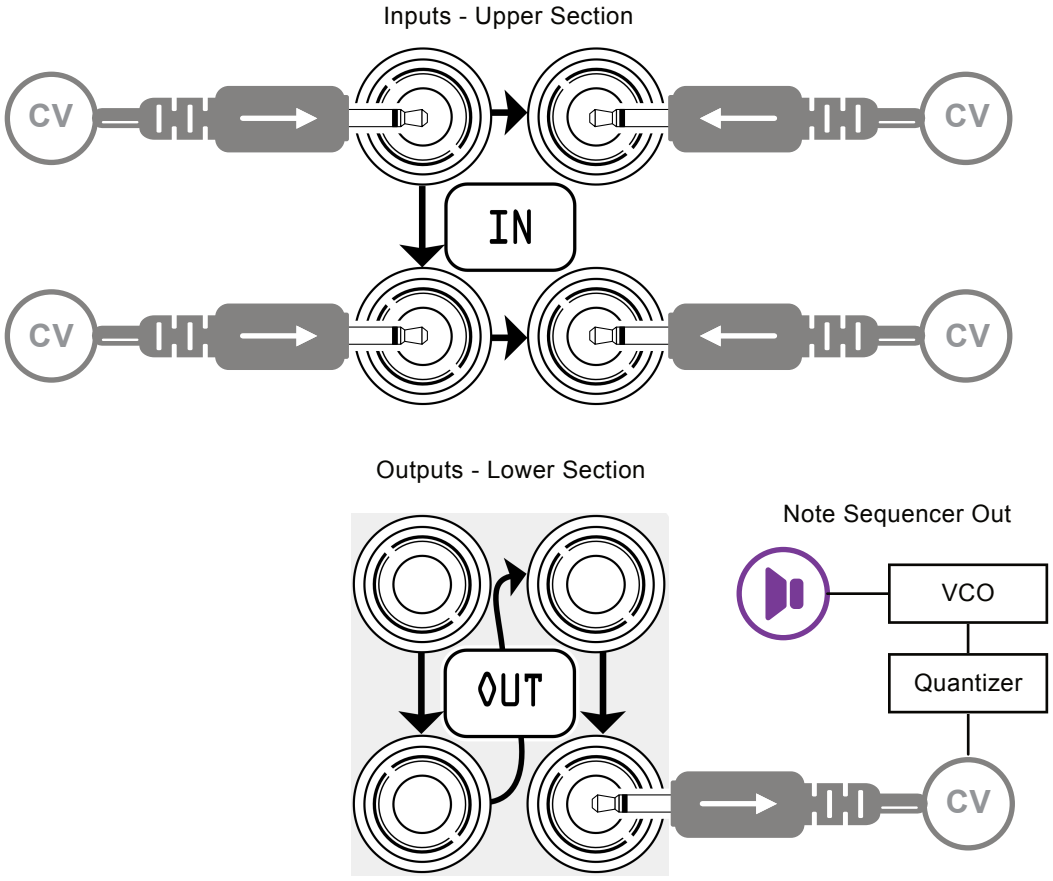




CONTROL VOLTAGE PATCHING WITH 3DVCA

Patch Example 12: Blending 4 CV Signals

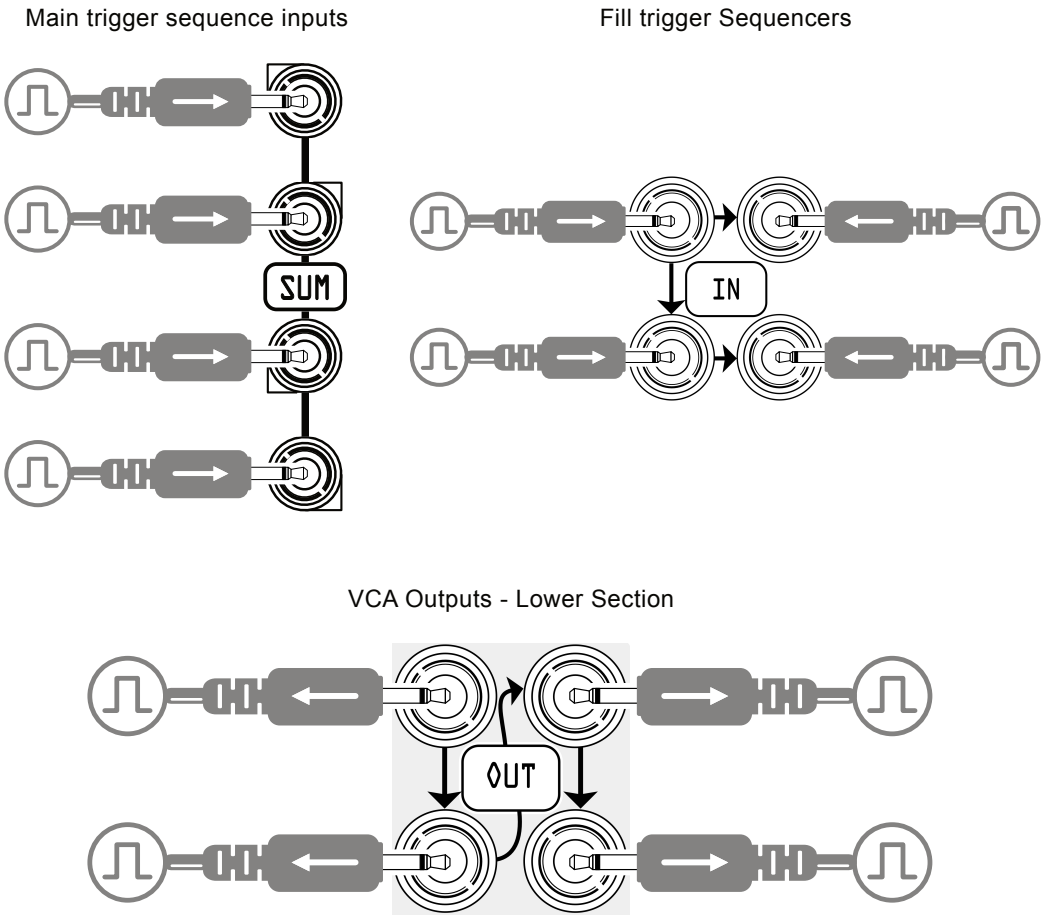
With four different note sequences plugged into each of the VCA inputs, you can take a blended output from the SE output. Plug this into the 1V/Oct input of your favorite VCO (ideally with a quantizer between the 3DVCA output and the oscillator) and now you can switch or mix between the four voltage sequences by activating only one of the four VCAs either with the panel controls or under voltage control. As you activate multiple VCAs at a time, you will hear the voltage sequence interpolate between any of the voltage sequences that are active. This allows the output to smoothly transition from one sequence to the next. You can set the overall note range of the output sequence using the 'Z' control. This does not work strictly like a "transpose"function since you are not simply adding the sequences together—blending these sequences will increase the level of one sequence as the level of another decreases. However, 3DVCA can be used to selectively transpose sequences by plugging your primary voltage sequence into one of the SUM inputs and using 'Z' to turn on or off the transposed sequences. I encourage you to experiment with multiple configurations to take advantage of the input normalization (ex. transpose two or more sequences, blend multiple sequences into each of the transposed sequences, etc).



X - Voltage Sequence Blend | Y - Top / Bottom Sequence Blend
Z - Overall Voltage Sequence Range

Patch Example 13: Trigger Sequencer Fills

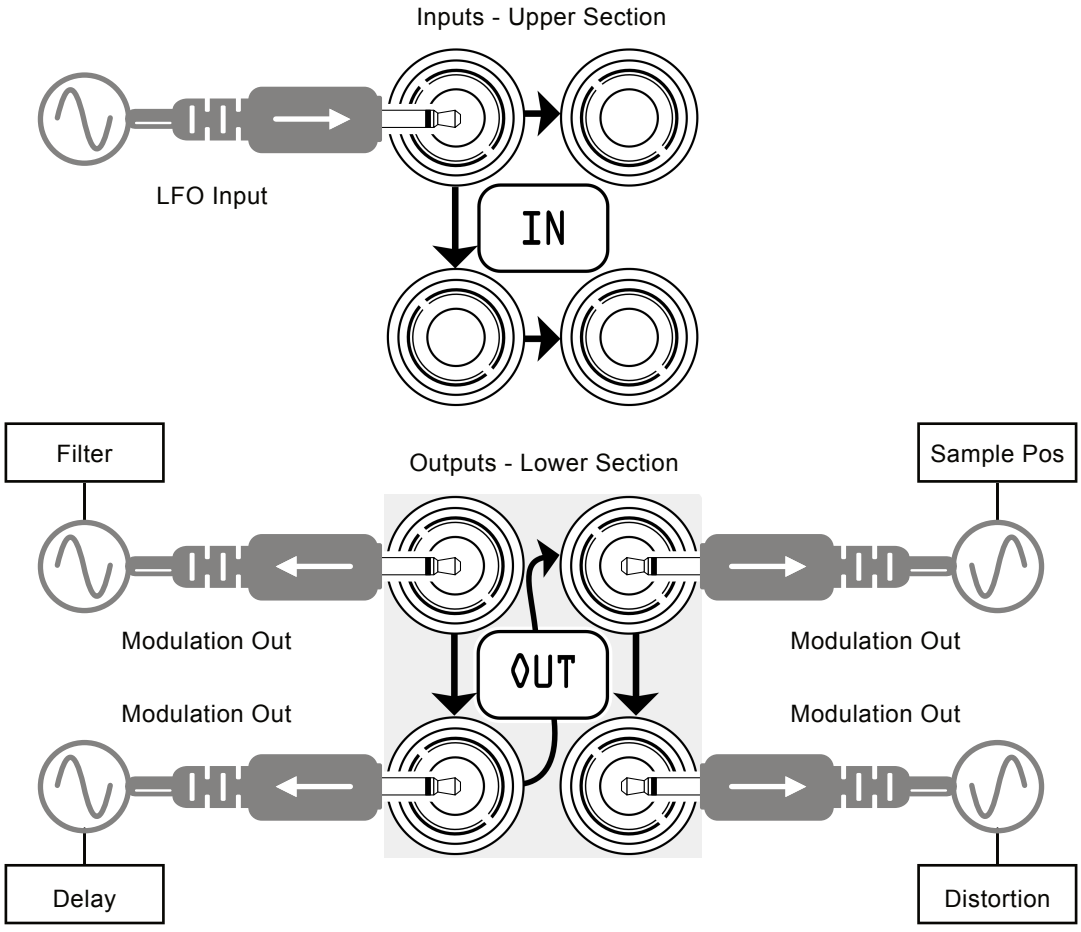
Plug your main trigger sequences into each of the four SUM inputs and then plug the four 3DVCA outputs into your various trigger destinations. Then, plug four trigger sequences that you would like selectively added to the main trigger sequences into the four VCA inputs. With the ‘Z’ control all the way down, you will only hear the main trigger sequence. Turning ‘Z’ up will add in the fill sequences, and ‘X’ and ‘Y’ will select which trigger channels are currently being modified. A nice quality of using 3DVCA for triggers is that when used with modules sensitive to trigger levels, having the smooth level control over our trigger sequences will allow you to achieve accents, ghost notes, or multiple levels of volume. If you choose to modify one or two trigger sequences (instead of four), then you can mix multiple trigger sequences together to achieve an even greater level of variety.



X - Left / Right Fill | Y - Top / Bottom Fill
Z - Fill Amount

Patch Example 14: Multiple Modulation Routings

We have all been in the situation where you have all of these modulation sources and so many modules that benefit from modulation that you want to fill up every available plug. Sometimes less is more. Modulation signals benefit from the ability to 1) control their level and 2) to turn off all modulation to avoid the seasick feeling that comes from giving everything its own LFO. 3DVCA is handy in such a scenario because you can take one modulation source and carefully balance where it is sent or mute modulation completely. Try patching an LFO into the NW input and then send all four VCA outputs to different modulation destinations. Control the overall level of modulation with 'Z' and select where the modulation is going with 'X' and 'Y'. Now patch two more LFOs into the 'X' and 'Y' CV inputs. You should notice that where the modulation is going is now also being modulated. At this point, we usually like to turn 'Z' all the way down and then either run a gate or another LFO into the 'Z' input to selectively add or take away modulation completely. This gives us a way to make a much more interesting and evolving patch by selectively sending modulation to multiple places instead of having modulation on all the time.



X - Left / Right Destination Select | Y - Top / Bottom Destination Select
Z - Overall Modulation Amount

Limited Warranty

Mystic Circuits warrants all products to be free of manufacturing defects related to materials and/or construction for a period of one (1) year following the product's purchase date by the original owner as certified by proof of purchase (i.e. receipt or invoice). This non-transferrable warranty does not cover any damage caused by misuse of the product, including incorrect connection of the power and / or expansion cables, or any unauthorized modification of the product's hardware or firmware.
Mystic Circuits reserves the right to determine what qualifies as misuse at their discretion and may include but is not limited to damage to the product caused by 3rd party related issues, negligence, modifications, improper handling, exposure to extreme temperatures, moisture, chemicals and excessive force.

Please Protect the Environment.
Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your local authority or retailer for recycling advice.

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