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MODULAR SYNTHESIZERS

ALPHA DUO

Alpha Duo User Manual

Alpha Duo is a stereo, precision VCA with ring modulation, overdrive and distortion.

1. Installation

Be sure to turn off rack power before starting installation. Please observe precautions for static sensitive devices when handling the module.

AlphaPro uses a 16-pin Doepfer standard power cable. Please take care to ensure that the cable is fitted the correct way round.

If using the supplied power cable, the plastic lug on the top of the cable connector should fit into the slot in the plastic shroud around the PCB connector.

2. Basic Operation

Alpha Duo has two signal inputs, IN L and IN R. The inputs are DC coupled, so you can use Alpha Duo to process both audio and CV. From the inputs, signals are first processed by the VCAs, then the Drive effect and finally the output pan.

In MONO mode – set by the MONO/STEREO toggle switch – the two inputs are summed together with the attenuation of each input being set by the corresponding input trim pot.

In STEREO mode, each of the two inputs is independent, with IN L feeding through to OUT L and IN R to OUT R.

In either mode, INITIAL GAIN, DRIVE (and the associated DRIVE MODE switch) and PAN are common to both signal paths.

There are two GAIN CV inputs, each with its own attenuator control. The QUADRANT switch controls how the GAIN CV effects the VCAs.

The DRIVE MODE switch turns on the overdrive effect, and controls the type of overdrive or distortion applied. The amount of the effect applied is controlled with the DRIVE knob.

The PAN control and the PAN CV input can pan the summed inputs in MONO mode, and act as a true stereo pan in STEREO mode.

Let's have a look at each of the controls in more detail.

3. Front Panel Controls and Inputs

1. STEREO/MONO SWITCH

This switch controls whether Alpha Duo behaves as a dual, summed input, mono unit with panned stereo outputs, or as a full stereo module. The sections below detail how the other controls function in the two modes.

2. INITIAL GAIN

This control sets the static gain of the VCA. With the control fully counter-clockwise the VCA is 'closed' – its gain is 0 and you won't hear anything unless a GAIN CV is applied. With the INITIAL GAIN control fully clockwise, the VCA is fully 'open'.

The INITIAL GAIN knob is exponential (a so called 'log' pot) so that it more closely follows the way we hear changes in volume.

3. GAIN CV INPUTS

Alpha Duo has two GAIN CV inputs, which control the gain of the VCAs. The voltage applied to these inputs is added to the INITIAL GAIN knob setting so, for instance, it's possible to set an initial volume using the pot, and then increase and decrease the volume using CV.

These inputs are calibrated to fully 'open' the VCAs at +5V. This is to allow the use of oscillators which have a nominal output of ±5V to control the VCAs. Many envelope generators produce a maximum of between 8V and 10V, so you may have to reduce the input level using the trim knob. The knob is linear, so if your envelope generator produces 10V, set the knob about half way.

4. LOG/LIN SWITCH

This switch sets the response of the GAIN CV inputs. With the switch in the LOG position, the VCAs respond exponentially to the GAIN CV, more closely following how we hear volume changes. With the switch in the LIN position, the VCA gain varies linearly.

Most envelope generators already have the 'log' curve baked in, so it's usual to set this control to LIN when using an envelope generator. However, if you wish to modulate volume using, for instance, a triangle wave oscillator, you may want to use the LOG response.

5. QUADRANT SWITCH

The GAIN CV inputs act in conjunction with the QUADRANT switch.

With this SWITCH set to '2', the GAIN CVs are summed together, along with the INITIAL GAIN knob, and control both the left and right channel VCAs.

The summed signal only effects the VCA if it is positive so, (assuming INITIAL GAIN is set to zero) any CV below 0V is ignored. Of course, if the INITIAL GAIN knob is turned up, then a negative CV can be applied to subtract from the effect of the INITIAL GAIN.

With the QUADRANT switch set to '4', the GAIN CVs are also summed together and added to the INITIAL GAIN knob value. However, in this setting, the VCAs are sensitive to negative GAIN CV values, which will invert the input signal. This produces a classic 'ring modulation' effect if audio is applied to both the signal input and the GAIN CV.

With the QUADRANT switch set to '4S' in STEREO mode, the two GAIN CVs are no longer summed together. Instead, each CV input controls its own VCA – the left GAIN CV input controlling the left VCA and the right GAIN CV controlling the right VCA. Both VCAs are still sensitive to negative gains. This setting turns Alpha Duo into two independent VCAs/ring modulators – though the INITIAL GAIN and DRIVE controls are still common.

Note that, in this '4S' setting and with Alpha DUO set to STEREO, the PAN control and PAN CV input have no effect.

6. DRIVE AND DRIVE MODE

Alpha Duo has two overdrive modes. Overdrive is off with the DRIVE MODE switch in position '0'. With the DRIVE MODE switch at position '1', Alpha Duo provides a soft overdrive effect, similar to a valve/tube amplifier. As with tubes, the positive and negative halves of the waveform are distorted differently, producing a warm, fuzz style of overdrive.
DRIVE MODE '2' is a much harder, clipped distortion, more like an overdriven transistor amplifier.
The DRIVE control increases the gain into the overdrive effect, producing more distortion as you increase the control.

7. PAN AND PAN CV

The PAN control and PAN CV input, unsurprisingly, pan the outputs. In STEREO, Alpha Duo implements a true, stereo pan, rather than the more common 'balance' type of control.

Alpha Duo is calibrated to provide very precise unity gain, however, due to the pan law implemented, unity gain is only available in MONO mode when panned fully to either OUT L or OUT R, or in 4S QUADRANT mode.

8. CLIPPING LED

The Clipping LED illuminates depending on the amount of distortion being produced by the DRIVE effect.
When DRIVE MODE is off (position '0') the Clipping LED will also illuminate when the outputs exceed the nominal Eurorack level. This is particularly likely when in MONO mode as the two signal inputs are summed. In this case, you can reduce the clipping by turning down the audio inputs using the attenuator knobs.

Specifications

Width: 10HP

POWER CONSUMPTION

+12v: 200mA
-12v: 50mA
+5v: 0mA

Inputs:
Signal (Zero attenuation): ±5v nominal, ±12v max
GAIN CV (Zero attenuation): ±5v nominal
PAN CV (Zero attenuation): ±5v nominal

Outputs:
Dual/Stereo: ±12v

Important Safety Instructions

Correct disposal of this product:

This symbol indicates that this product must not be disposed of with household waste according to WEEE Directive (2012/19/EU) and your national law. This product should be taken to a collection centre licensed for the recycling of waste electrical and electronic equipment (EEE).