

# FINALISER REQ

## User Guide

### Reverb, Equaliser and Sonic Enhancer

Thank you for purchasing the AJH Synth FINALISER REQ module, which like all AJH Synth Modules, has been designed and handbuilt in the UK from the very highest quality components. We hope that it will help and inspire you towards creating some great music and soundscapes!

Designed to be the last link in the Eurorack signal chain, a module that can apply parametric equalisation, maximiser / exciter and reverb to add that “finishing touch” to your Eurorack patch.

It is primarily a Mono in, Mono out or Mono In, Stereo out device that can apply Stereo reverb to Mono Source signals. It will also work as a Stereo IN / Stereo out module too, however in this case the Equaliser and Enhancer can only be applied to the Left audio channel.

The fully analogue four band Equaliser includes three parametric equalisers for Low, Low Mid and High Mid ranges, and the High EQ has switchable shelving of either 2kHz or 5kHz.. The Low EQ also includes a useful shelving mode.

The Maximiser is a fully analogue circuit too, with low and high treatment bands which change the phase and amplitude relationships of the sound to add punch and harmonics and really bring the sound to life in the mix.

The Reverb engine is based on 20 year old DSP technology, harking back to the reverb units which were used extensively on many synth and EDM tracks a couple of decades ago. It includes eight different effects and includes full control of reverb wet / dry mix, either manually or under CV control.

Module width is 18 HP of Eurorack space and it is compatible with standard Eurorack cases. The height of the panel is 128.5mm and depth is 24mm . There are four mounting holes at the corners of the module and we provide 4 of M3 rack fixing screws along with a Eurorack compatible power cable. Current consumption is 105mA from the +12V supply rail and 55mA from the -12V supply rail.

All AJHSynth modules are covered by a two year guarantee against manufacturing defects.

*Note:*

*It is very important that the power supply ribbon cable is connected correctly, see the “adjustment and calibration” section for an illustration of the correct orientation.*



[www.ajhsynth.com](http://www.ajhsynth.com)

# Overview

The Finaliser REQ has been designed to be the last module in the signal chain and add some professional “polish” to your patch, and comprises three separate sub modules:

## 1 - A fully analogue, four channel equaliser:

Three of the channels (Low, Low Mid, High Mid) have parametric equalisation, i.e. it is possible to select the centre frequency of the equaliser, and then add up to 24dB of variable Q boost or cut around the selected frequency. The Fourth (high) channel has selectable shelving frequencies of 2kHz and 5kHz. The Low channel also has a selectable peak or shelving response.

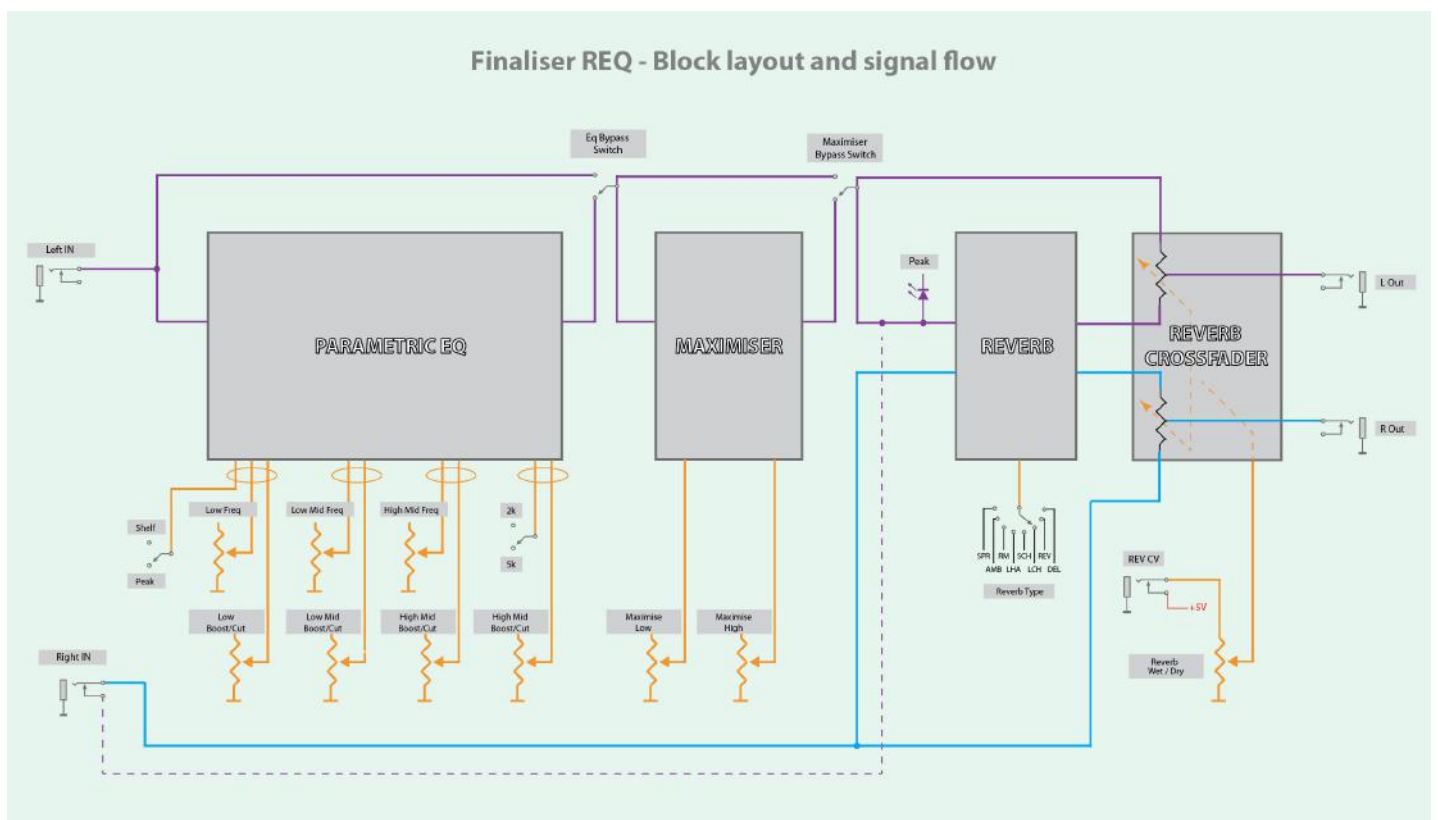
## 2 - Sonic Enhancer with High and Low enhancement channels

The Enhancer works by applying phase correction to a specific frequency range, the LOW Enhancement can add extra punch to the bottom end without muddying up the midrange, and adding HIGH Enhancement adds extra sparkle and presence to the mix.

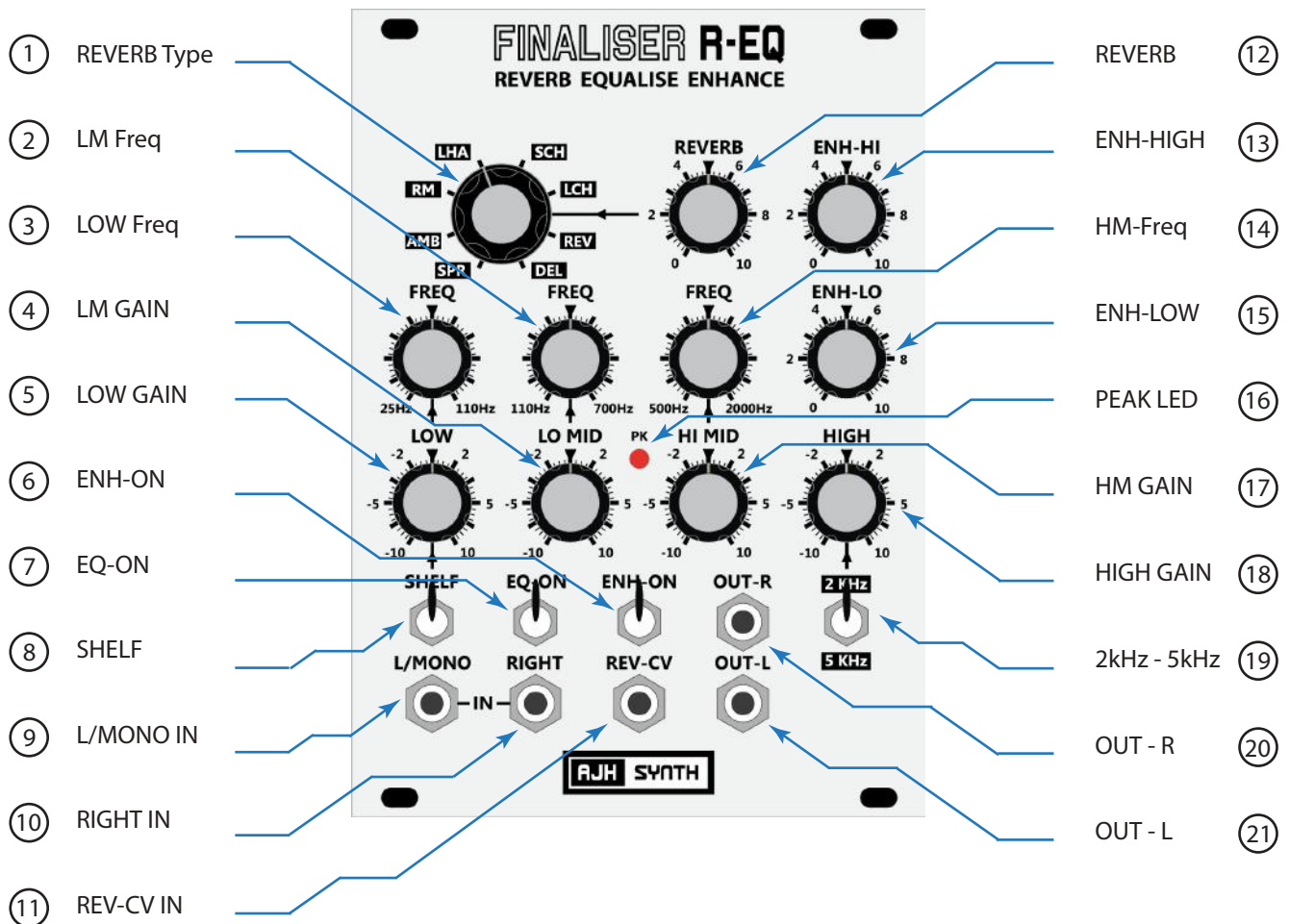
## 3 - High quality Stereo Reverb with eight preset reverb models

We have selected eight “old school” style stereo reverbs that sound great with synthesiser patches, with an quick and easy eight way selector switch and Wet/Dry control either from a front panel control or external CV signal.

The block diagram below shows how the above component parts are connected together and the signal flow between them. There are bypass switches for both the Equaliser and the Enhancer modules, so that these can quickly be switch in or out for a quick and easy comparison against the incoming dry signal. The left audio signal (post EQ and enhancement) is normalised to the RIGHT input, so that stereo reverb can be added to a Mono Input.



# Front panel controls



- ① REVERB Type : This switch selects the Reverb Type from the following simulations: - **Spring, Ambient, Room, Large Hall, Small Concert Hall, Large Concert Hall, Reverse, Fixed Delay**
- ② LM Freq : This control sets the centre frequency for the LOW MID range parametric equaliser, approximate range is 110Hz to 700Hz.
- ③ LOW Freq : This control sets the centre frequency for the LOW range parametric equaliser, approximate range is 25Hz to 110Hz.
- ④ LM GAIN : This control sets the boost or cut level for the LOW MID range parametric equaliser. The boost / cut range is approx +/- 25dB.
- ⑤ LOW GAIN : This control sets the boost or cut level for the LOW range parametric equaliser. The boost / cut range is approx +/- 25dB.
- ⑥ ENH-ON : Enhancer bypass switch - the Left Audio signal is routed through the Enhancer when this switch is down, with switch up the Enhancer is bypassed.
- ⑦ EQ-ON : EQ bypass switch - the Left Audio signal is routed through the EQ signal processor when this switch is down, with switch up the EQ section is bypassed.

- ⑧ SHELF : Sets the response for the LOW parametric equaliser, with the SHELF switch up the EQ is in standard "peak" mode, with the SHELF switch down the Shelf Low frequency mode is active.
- ⑨ L/MONO IN : Left Audio INPUT. Signals fed into this input can be routed to the Equaliser and Enhancer sections, which are mono only. Expected signal levels are 10v p/p, centred around 0v.
- ⑩ RIGHT IN : Right Audio INPUT. Signals fed into this input are routed directly to the Right REVERB input, the equaliser and Enhancer are not available on this input. With no jack connected the signal from the Left audio signal, (downstream of the Enhancer), is normalised to this input, so that stereo reverb can be applied to Mono signals. Expected signal levels are 10v p/p, centred around 0v.
- ⑪ REV-CV IN : An external CV voltage can be patched to this input to control the Wet / Dry mix of the Reverb, and in this case the REVERB control becomes an attenuator. With the REVERB control fully clockwise the effective control range for the REV-CV control voltage is 0 to +5V. Any negative voltages are seen as 0V and voltages higher than +5V are capped at +5V. The maximum permissible voltage to this input is -12V to +12V.
- ⑫ REVERB : REVERB control, this sets the mix of wet (reverb) signal against dry (input) signal, with the control fully anti-clockwise the dry signal only is heard, with control fully clockwise full reverb is selected, all positions are a varying mix of wet and dry signals.
- ⑬ ENH-HIGH : Controls the amount of high end ENHANCED signal that is mixed with the dry signal. The control range is quite large and at high settings it can easily overload the Reverb section, which will be indicated by the PEAK LED (16) illuminating, in this case the input signal level to the L/MONO IN should be reduced until the PEAK LED is no longer lit.
- ⑭ HM-Freq : This control sets the centre frequency for the HIGH MID range parametric equaliser, approximate range is 500Hz to 2000Hz.
- ⑮ ENH-LOW : Controls the amount of low end ENHANCED signal is mixed with the dry signal. The control range is quite large and at high settings it can easily overload the Reverb section, which will be indicated by the PEAK LED (16) illuminating, in this case the input signal level to the L/MONO IN should be reduced until the PEAK LED is no longer lit.
- ⑯ PEAK LED : Indicates when the signal level reaching the REVERB section is getting to within 3dB of becoming overloaded.
- ⑰ HM GAIN : This control sets the boost or cut level for the HIGH MID range parametric equaliser. The boost / cut range is approx +/- 25dB.
- ⑱ HIGH GAIN : This control sets the boost or cut level for the HIGH range equaliser. The boost / cut range is approx +/- 25dB.
- ⑲ 2kHz - 5kHz : Sets the frequency at which the HIGH range Equaliser becomes active, the choice of -3dB slopes are 2kHz and 5kHz.
- ⑳ OUT - R : The Right output from the Reverb Crossfader module. Signal level is a nominal 10v p/p.
- ㉑ OUT - L : The Left output from the Reverb Crossfader module. Signal level is a nominal 10v p/p.

# FINALISER R-EQ - PATCHING EXAMPLES

## Two voices patched in Stereo in / Stereo out Mode

In this patch we are using the Finaliser R-EQ in Stereo In / Stereo out mode.

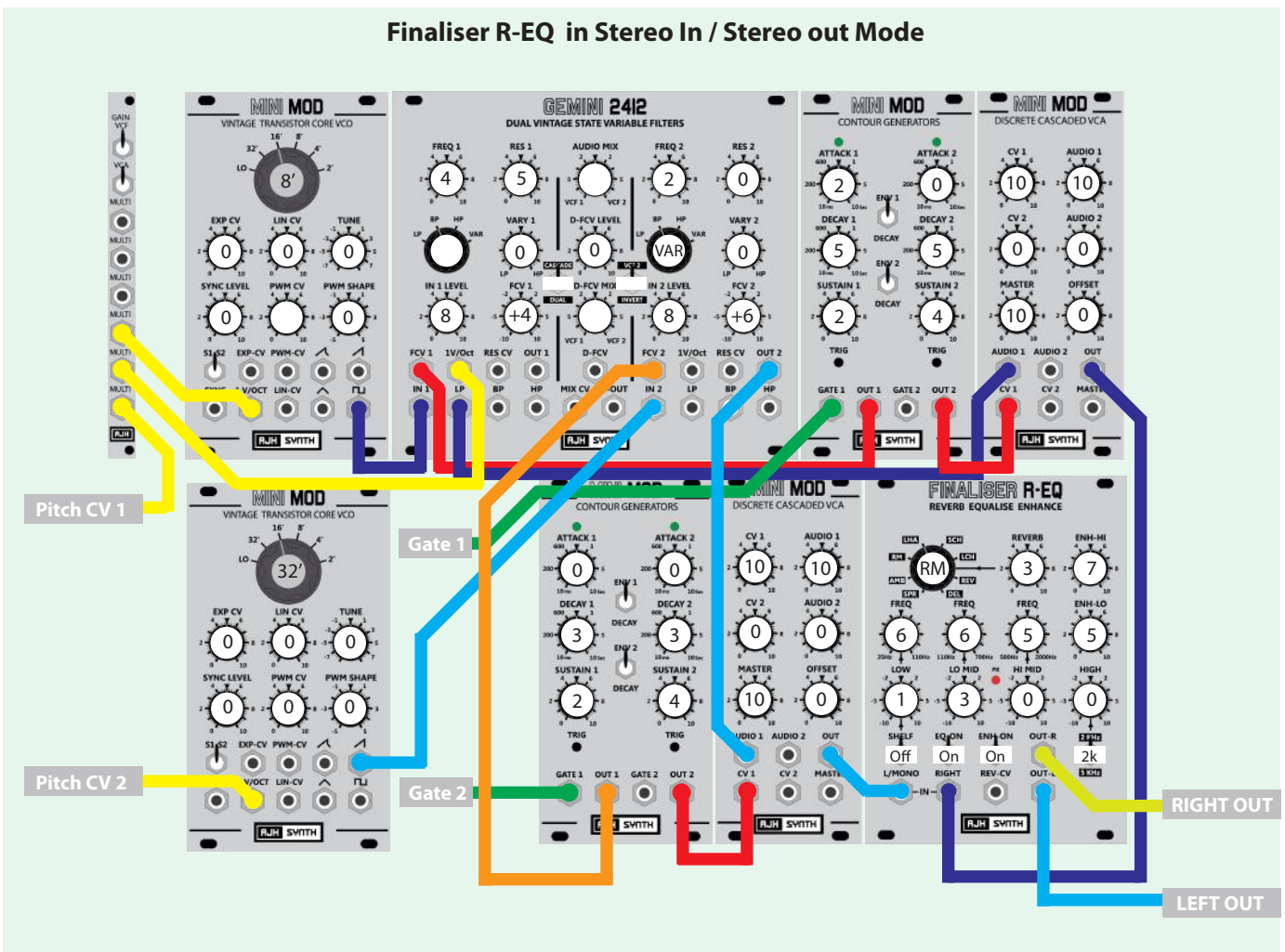
We have two independent synth voices, both voices are patched into the Gemini 2412 Dual VCF, however it is being used as two independent VCF's here. We have a bass patch (from Out 2 of the Gemini) which is patched to the L/Mono input of the Finaliser R-EQ, so full EQ is possible - and here we have both the equaliser and enhancer switched into circuit, and have set up a small amount of boost to the Low and Low Mid parametric equalisers. The Enhancer has a small amount of Low enhancement and a larger amount of High enhancement, to bring up the harmonic content of the bass patch. The EQ and ENH on/off switches are very useful here, as can be used as bypass switches so that we can quickly a/b compare the equalised against bypassed sounds to make sure that we are actually improving the sound!

The Equalisation and Enhancement only processes signals to the L/Mono input, which in this case is the Bass voice, the Lead voice is fed into the Right input, which means that it is routed directly to the stereo reverb. Internally the output of the Equaliser and Enhancer is fed to the Left input of the Reverb, so in this example we have EQ and Enhancement on the Bass voice only, and Stereo Reverb on both the Lead and Bass voices. The Reverb amount is set with the Reverb control, alternatively the Reverb wet / dry mix can be automated by patching a positive control voltage to the REV-CV input.

If the Finaliser becomes overloaded because of the addition of high levels of EQ or Enhancement then the red Peak LED will illuminate, and beyond this point distortion may occur - this can be countered by reducing the signal level to the input of the Finaliser R-EQ, in this case by reducing either the Audio 1 or Master control levels on the MiniMod VCA

*Note: The numbers used to illustrate control knob positions do not relate to the markings on the module itself, but are simply a scale from zero to 10 with 5 being the control centre position. For attenuverters the control positions are -10 to +10, with zero being centre position for the control knob.*

### Finaliser R-EQ in Stereo In / Stereo out Mode





### 3 VCO Plus dualSubBass patch - Mono in / Stereo out Mode

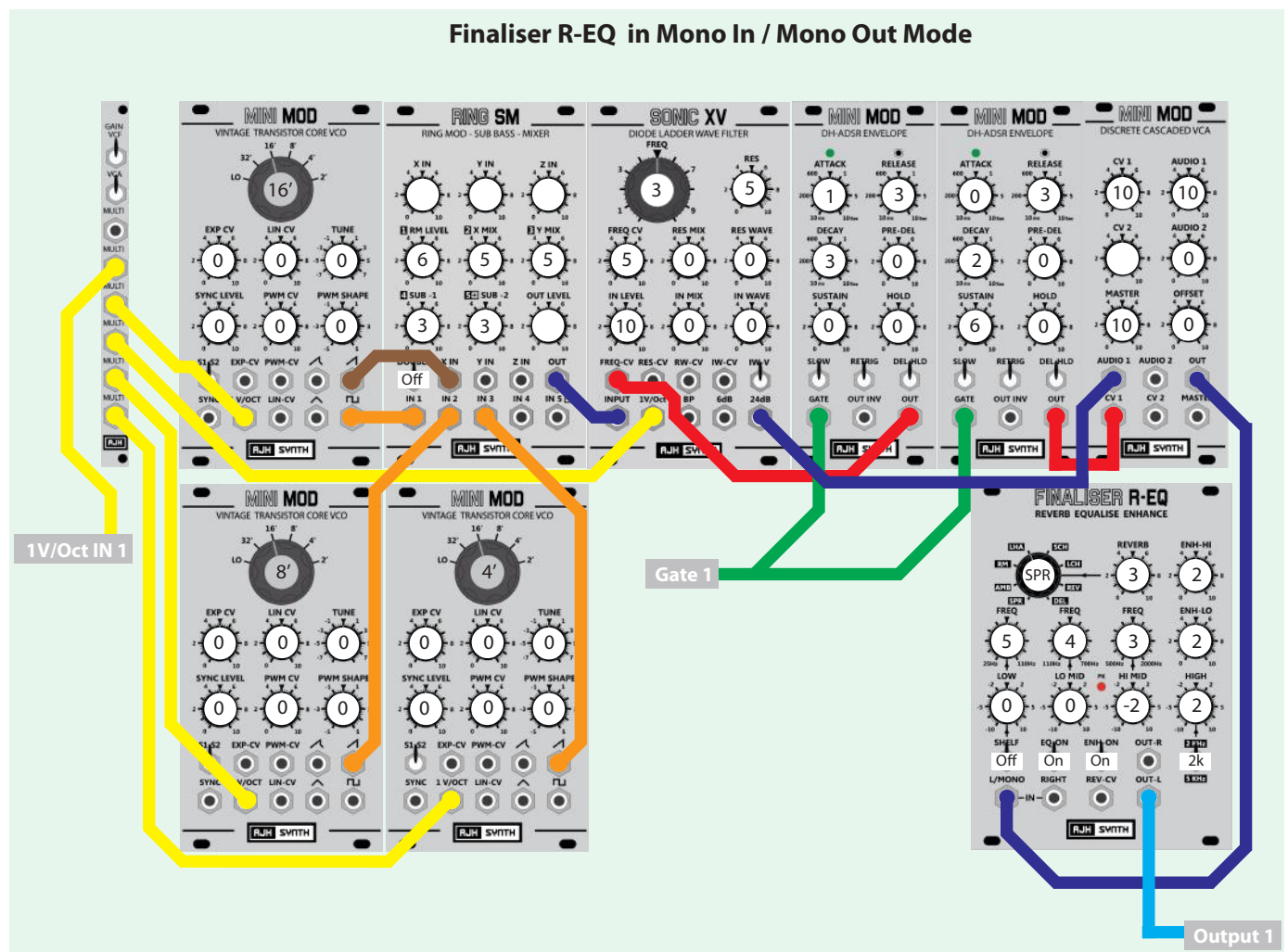
Here we are using the Finaliser in Mono in / Mono Out Mode, with the Equaliser and Enhancer engaged.

The Finaliser is used to add some reverb and a little EQ and enhancement to what is a very fat sounding patch, there are three VCO's fed into the Ring SM Module, which is used as a mixer (Inputs 1, 2 and 3) but we have also patched in the Ramp wave from VCO to the Ring SM "X" Input, and this is acting as a trigger for the Sub bass generators, so we also get Sub waveforms at -1 and -2 octaves below the incoming waveform, so we have the equivalent of 5 VCO's spanning five octaves! And each of the levels can be adjusted from the Ring SM, with the output being fed into the Input of the Sonic XV Diode Ladder filter.

We are using 2 x DH-ADSR Envelopes in regular ADSR Mode, one to control the filter and the second controlling the VCA output against time.

If the Finaliser becomes overloaded because of the addition of high levels of EQ or Enhancement then the red Peak LED will illuminate, and beyond this point distortion may occur - this can be countered by reducing the signal level to the input of the Finaliser R-EQ, in this case by reducing either the Audio 1 or Master control levels on the MiniMod VCA

*Note: The numbers used to illustrate control knob positions do not relate to the markings on the module itself, but are simply a scale from zero to 10 with 5 being the control centre position. For attenuverters the control positions are -10 to +10, with zero being centre position for the control knob.*



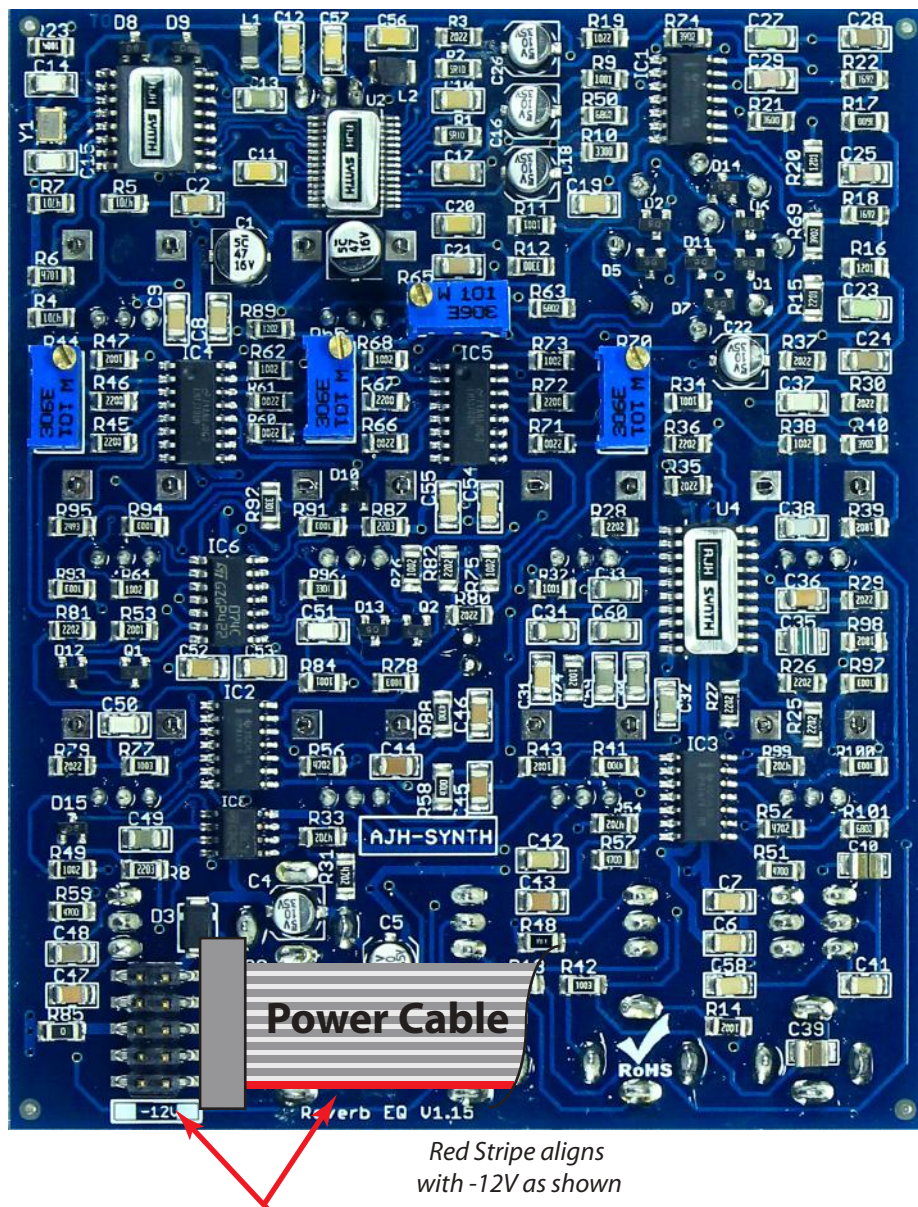
# FINALISER REQ - Specification

<b>Description:</b>	Analogue four channel Equaliser, two channel analogue Sonic Enhancer and Stereo Reverb Eurorack signal processing module.
<b>Dimensions:</b>	18HP x 3U Eurorack, 91.3mm x 128.5mm
<b>Power usage:</b>	+12V, -12V 10 pin Eurorack power header. Reverse polarity protection is built in.  Power consumption: Positive rail: 105 mA, Negative rail: 55mA
<b>Inputs:</b>	L/MONO Input & RIGHT Input - Expected signal level 10V p/p, centred around 0V. Audio signals only, DC signals are ignored.
<b>Outputs:</b>	Nominally 10V p/p, noise <25mV
<b>CV Inputs:</b>	REV CV: The accepted signal range is 0V to +5V. Any voltages higher or lower than this will be capped to 0V or +5V, so negative voltages are ignored. Maximum permissible voltage to this input is +/-12V.

## Adjustment and Calibration

### Important note:

The Gemini 2412 module is calibrated after manufacture and under normal circumstances should not require any user adjustment. Trimmers not documented are for manufacturer's use only and have tamper paint over the adjuster. We will not accept any modules returned for repair under warranty because the module has been incorrectly adjusted by users, to correct this and bring the unit back to full working order full calibration will be required, this is a fairly lengthy process and in this case will be a chargeable service.



If you need any help using this module or have any technical questions please feel free to contact us at [support@ajhsynth.com](mailto:support@ajhsynth.com)