



# GC Audio Analog Riser User Manual

Thank you for purchasing the GC Audio Analog Riser.  
We hope you enjoy using it as much as we enjoyed designing it!



The GC Audio Analog Riser is a high-end dynamics and harmonics processor, which allows you to obtain sharp and unique dynamics and harmonics processing. It offers a unique sound signature for demanding engineers, right up to the mastering stage.

Several years of research and development have been necessary to create this analog processor so that it can be used in all areas of the audio business.  
An uncompromising electronic design has been made to obtain an irreproachable sound quality.

The GC Audio Analog Riser will allow you to process sound with confidence and pleasure for recording, mixing and mastering.

The Analog Riser is a fully analog design built around 5 tubes, 4 VCAs, 4 Lundhal transformers, a hundred low noise operational amplifiers, Grayhill switches, IP knobs, etc. Its powerful combinations of harmonic processing / make up and MS mode make it a unique machine. A high voltage EZ81 tube power supply is also present and offers a high quality choke filtering system allowing a very low residual ripple. The lamp power supply also allows for a gradual rise in high voltage, which preserves the life of the 12AY7 lamps.

No signal goes through the front panel switches. About 40 relays ensure a routing as close as possible to the motherboard.

Each functions is trimmed in factory in order to have the best matching between left and right.

# Technical Data:

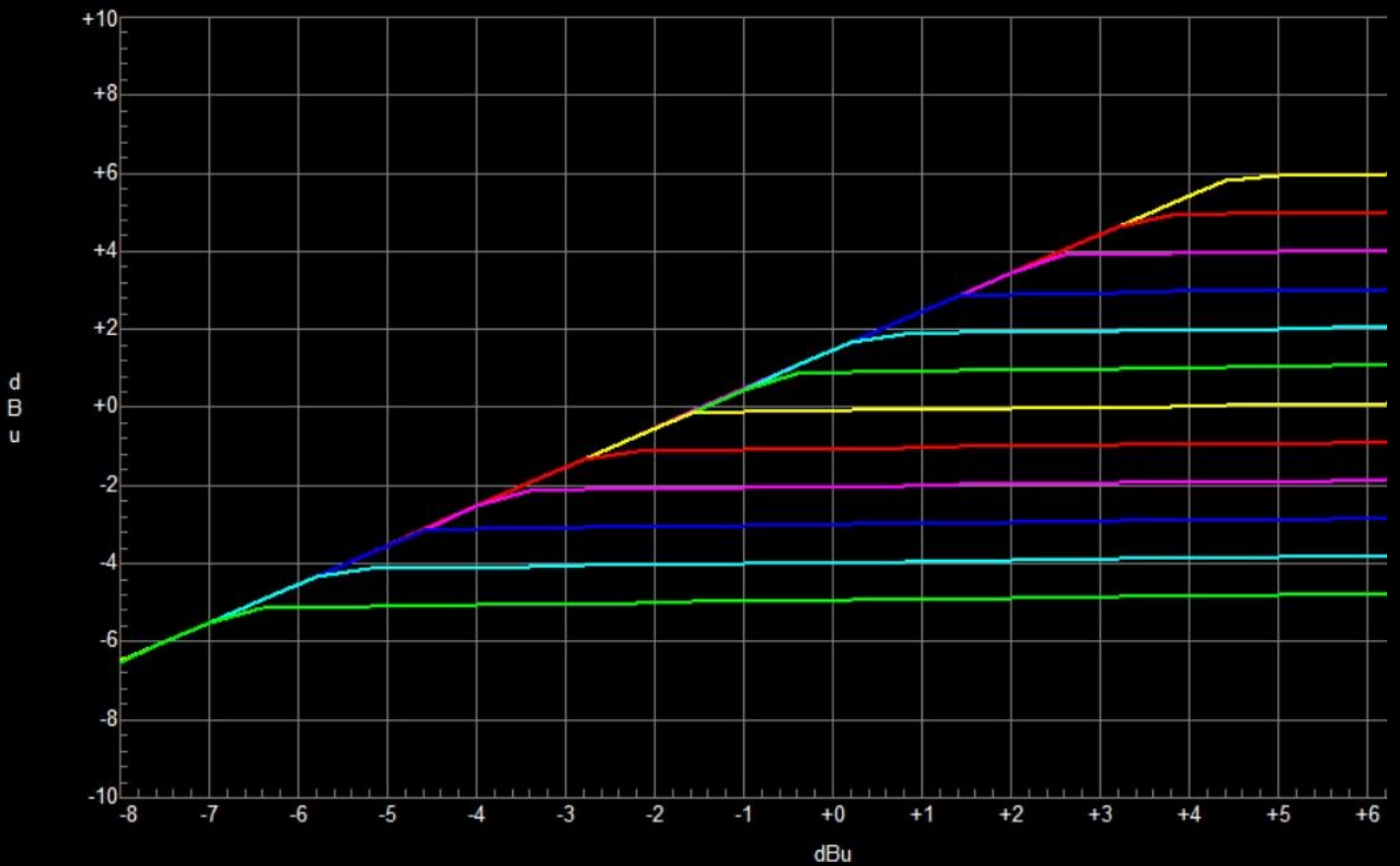
- 1) Equalizer stage:
  - High pass 12 dB / octave, 20hz to 300hz.
  - Low pass 12 dB / octave, 250hz to 20khz.
  - Low frequency 20hz to 500hz, gain -12dB to + 12dB, variable Q.
  - Medium frequency 300hz to 6khz, gain -12dB to + 12dB, variable Q.
  - High frequency 5khz to 20khz, gain -12dB to + 12dB, variable Q.
  
- 2) Compressor stage:
  - Threshold -30dB to +10dB
  - Ratio 12 steps, 1.5 to 10.
  - Attack 0.5ms to 300ms.
  - Release 1.5ms to 1.5s
  - Make up -20dB to +20dB
  - Knee setting (Soft / Hard)
  - Auto creator setting (automatic fast Attack and Release for transient).
  
- 3) Harmonic Stage:
  - Harmonic generator.
  - Harmonic mix density.
  
- 4) Tube Stage:
  - Gain 0dB to 20 dB.
  - 4 stages of 12AY7 tubes on each channel.
  - High voltage power supply with EZ81 bridge.
  
- 5) Brickwall limiter stage:
  - Fixed ultra fast attack trimmed in factory.
  - 12 steps threshold +6dBu to +5dBu.
  - 8 steps release 10ms to 1.5s.
  
- 6) Hybrid power supply:
  - Very low ripple linear stage with tube bridge and Hammond choke for supply tube amp.
  - High end medical standard AC/DC converter stage for supply discrete.
  - 110V to 230V compatibility with switch on rear face.
  
- 7) Manufacturing details:
  - High definition vu meter for output volume with two speed setting (RMS or Transient).
  - High definition vu meter for gain reduction.
  - IP water proof knobs for power on, stereo on and M/S on.
  - Analog / Ground connector on rear face.
  - Input: Combo Neutrik XLR / jack balanced connector.
  - Output: Neutrik XLR and jack balanced connector.
  - High definition serigraphy.

# CURVES:

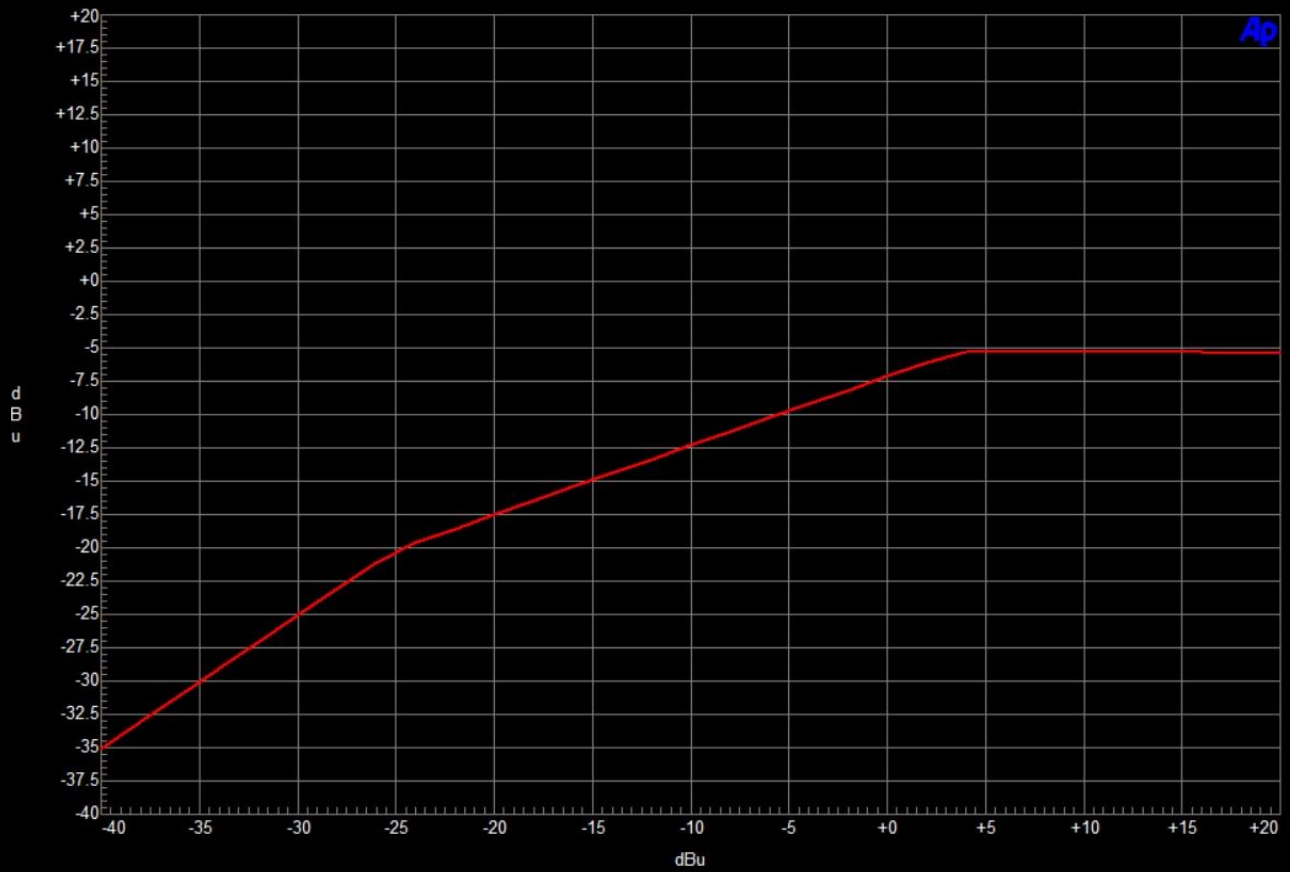
Compressor, red = Hard Knee, green = soft knee:



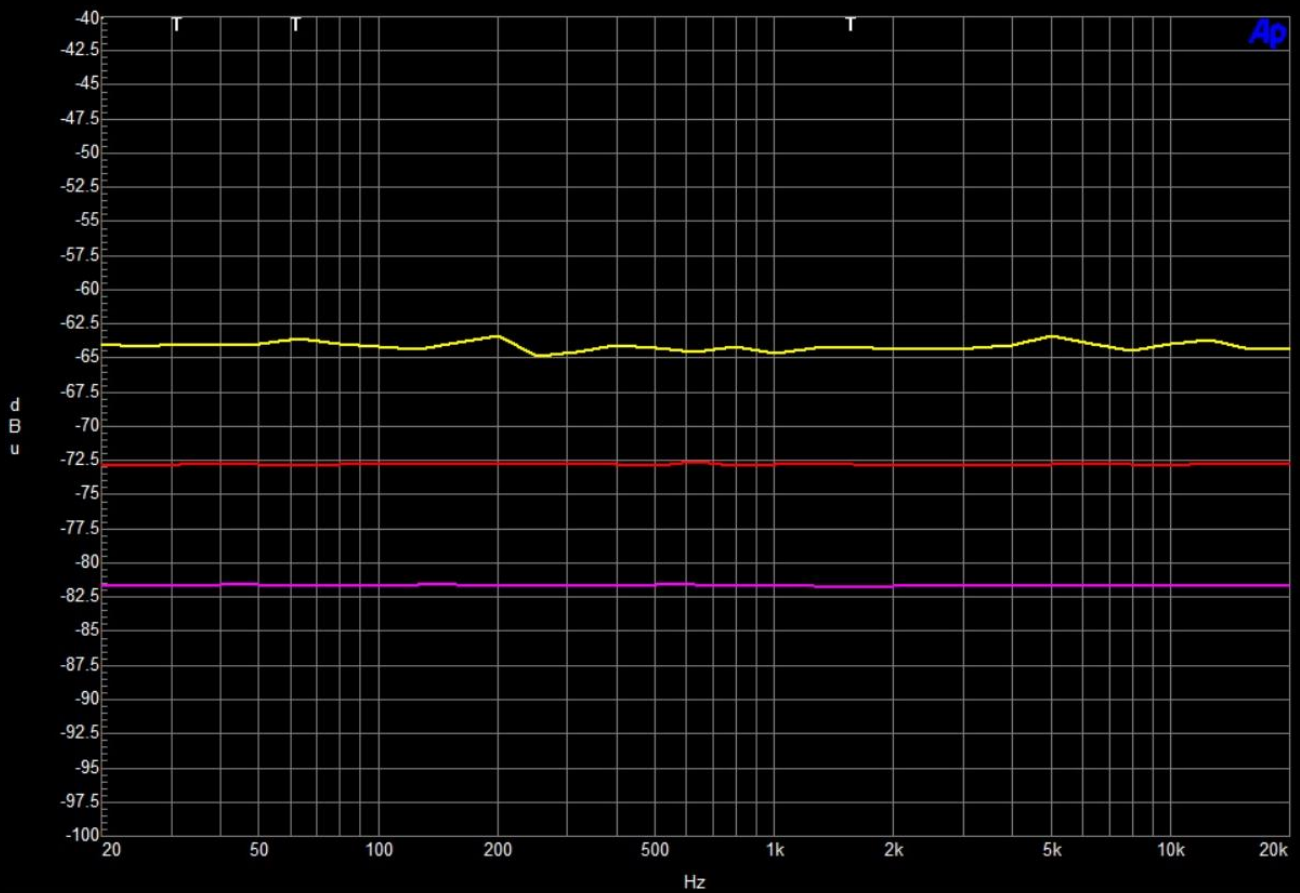
Limiter, 12 steps -5 dBu to +6dBu :



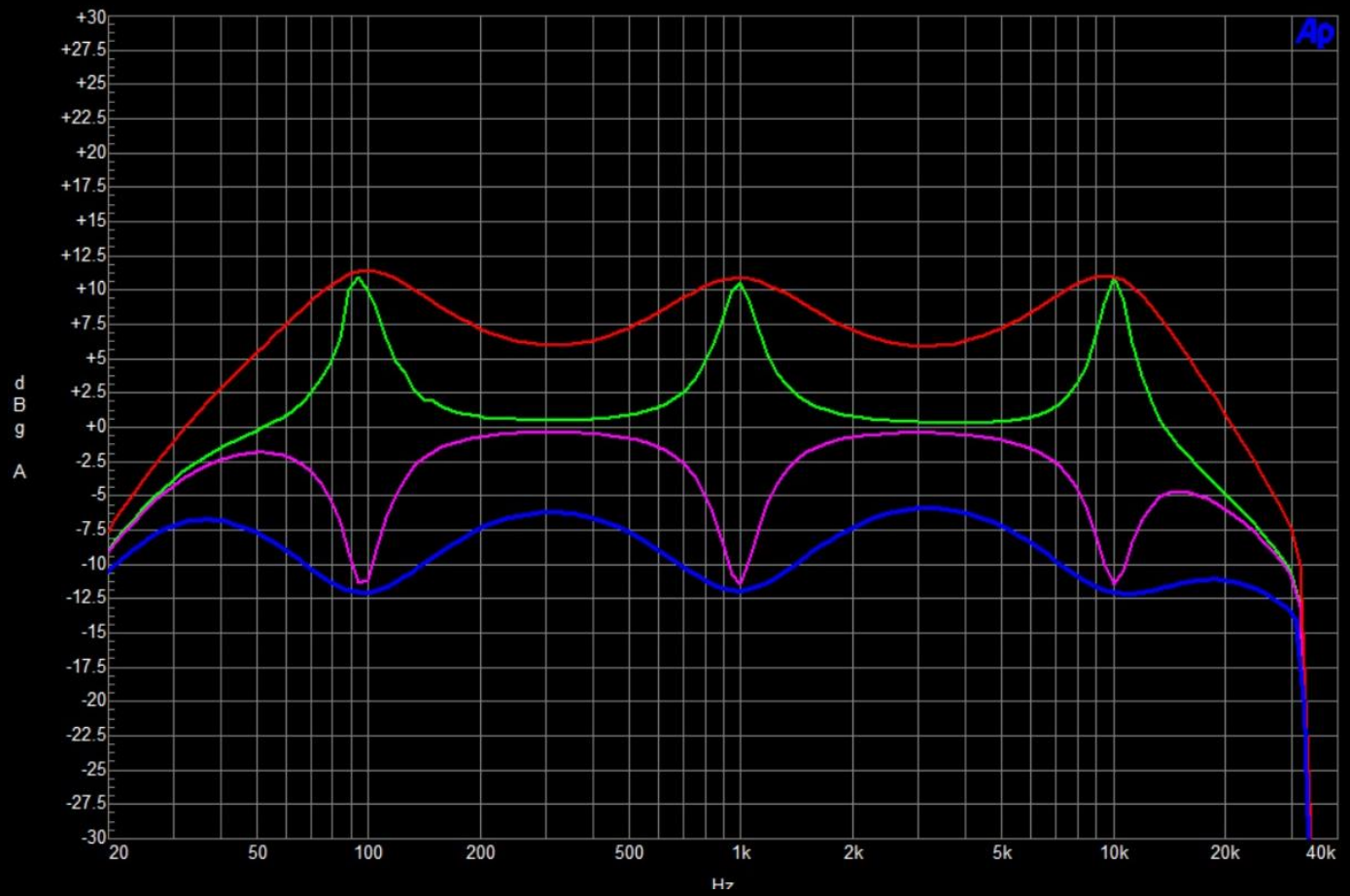
Compressor an limiter in series :



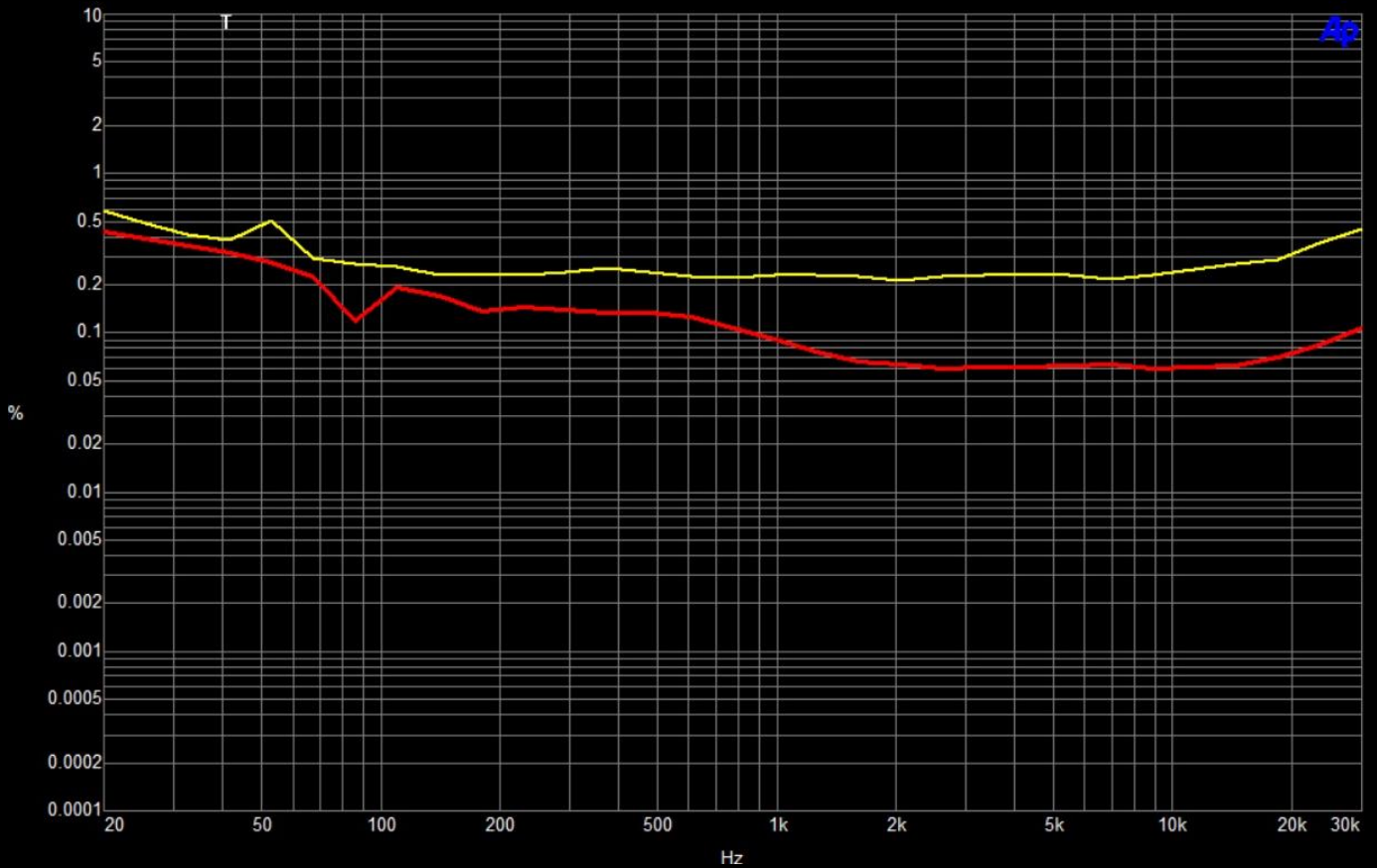
Typical noise, Yellow = tube stage, red = compressor stage, purple = harmonic stage:



## Equalizer typical curves:



Harmonic distortion, Yellow = tube make up, Red = discrete make up:



# The Analog Riser offers 5 processing stages in one machine:

## 1) A 3-band full parametric equalizer with Low Cut and High Cut:



Although the primary function of this EQ is to define a multiband contour for the compressor detection threshold, it can also be used as a stand-alone EQ.

In Sidechain mode (compressor stage on), it has a narrow bandwidth for optimal VCA stability. The use of the equalizer in insert in the compressor sidechain allows to realize very precise dynamic treatments. Indeed, to avoid a compression "pumping", a Low Cut is often used in the Sidechain to discriminate for example, the bass drum. Unfortunately this does not only discriminate the bass drum but the whole low end of the spectrum. With the multiband contour you can first find the exact frequency of the bass drum and only separate this frequency at the level of the compressor's release threshold.

In the opposite case, which may be desired for electro music for example, you can turn up the gain only on the bass drum frequency which will give you a stable pumping with a good rhythmic behavior. More globally, the multiband VCA contour will allow you to compress at different thresholds the pleasant and the unpleasant frequencies.

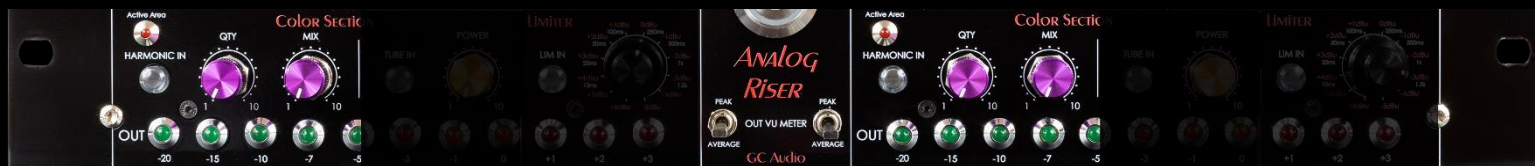
## 2) A full VCA compressor:



This compressor is built around a state-of-the-art VCA and features full adjustment of the Time, Threshold and Make Up components. With impeccable characteristics in terms of signal to noise ratio and distortion, it is particularly stable.

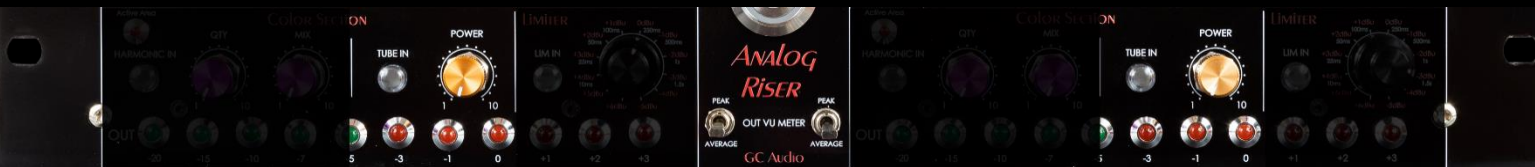
Note that it is equipped with a new and original function: "Auto Creator". In this mode, the Attack and Release are automatic. They will be globally fast but vary according to the speed of the input signal. The times will be different depending on the nature of the signal: transient or constant signal. This is a very interesting function on percussive sources or bass.

### 3) A Harmonic treatment stage :



This stage generates odd harmonics. It is possible to define the amount of harmonics generated as well as the density integrated in the original signal. The electronic design has been optimized so that this function adds a proximity presence to the signal, thus treating more the top of the spectrum.

### 4) A full tube gain stage :



The spirit of this tube stage is to extract the full essence of the vacuum tube character. Each channel consists of four 12AY7 lamp stages. A high voltage EZ81 tube power supply is also present and offers a high quality choke filtering system allowing a very low residual ripple. The lamp power supply also allows for a gradual rise in high voltage, which preserves the life of the 12AY7 lamps.

The Analog Riser allows two types of make up: The discrete make up of the compressor stage which will have a very transparent rendering and the lamp make up which allows to color the signal, or even give it a saturation. To use the maximum potential of the headroom of the tube stage, it is interesting to reduce the make up of the compressor stage beforehand.

### 5) A Brickwall type Limiter:



The last output stage of the Analog Riser is a Brickwall Limiter with 12 Threshold positions. To avoid saturating your converters, the optimal setting is +4dBu, which will give you 0dBfs at the input of your DAW.

Each position is factory set to a negative tolerance. For example, the +ddBu position will have a real level of -0.00 dBfs, which ensures no digital saturation.

The Limiter does not defy the laws of physics, but by pushing the Make Up to its limits, the dynamic range will be reduced and the overall volume impression can increase considerably without exceeding +4dBu (0db VU).

# The Analog Riser has 3 operating modes:

## 1) Mode Dual Mono:

Configuration A: All stages are active:



This is the default mode when you power on the. An analog processor with two completely independent channels. In this mode, you can simultaneously process two tracks independently. As the device has many functions, it is necessary to understand its routing, which prioritizes dynamic processing above all. Please consider the following diagrams:

Configuration A: When all stages are on, the machine offers the following functions in order from top to bottom: Multi-band sidechain stage with LPF and HPF > VCA compressor > Harmonic > Tube > Limiter

Configuration B: When all stages are active but the Compressor stage:





## 2) Stereo Mode:

After turning on the machine, press the "STEREO LINK" button.

This mode is dedicated to stereo BUS compression.

The BUS compression being generally positioned on moderate ratios, it has been chosen a L+R summation for the Sidechain input. The limiter works on a ratio of +Infinite, it has no summation on the sidechain input in order to keep a faithful stereo image. A common Threshold, calibrated from factory, allows a precise adjustment between L and R. Also a Link of the VCA time control allows an identical behavior.

In this mode, all control knobs are linked to obtain a very precise and identical adjustment between Left and Right.

An "Active zone area" LED allows you to define the zones whose knobs are functional. Although the potentiometers are linked, the functions of both channels work and to activate a function, it is therefore necessary to switch it on the left channel and on the right channel. As the machine has many functions, it is necessary to understand its routing which prioritizes above all the dynamic processing. Please consider the following synoptic:

**Configuration A:** When all stages are active:



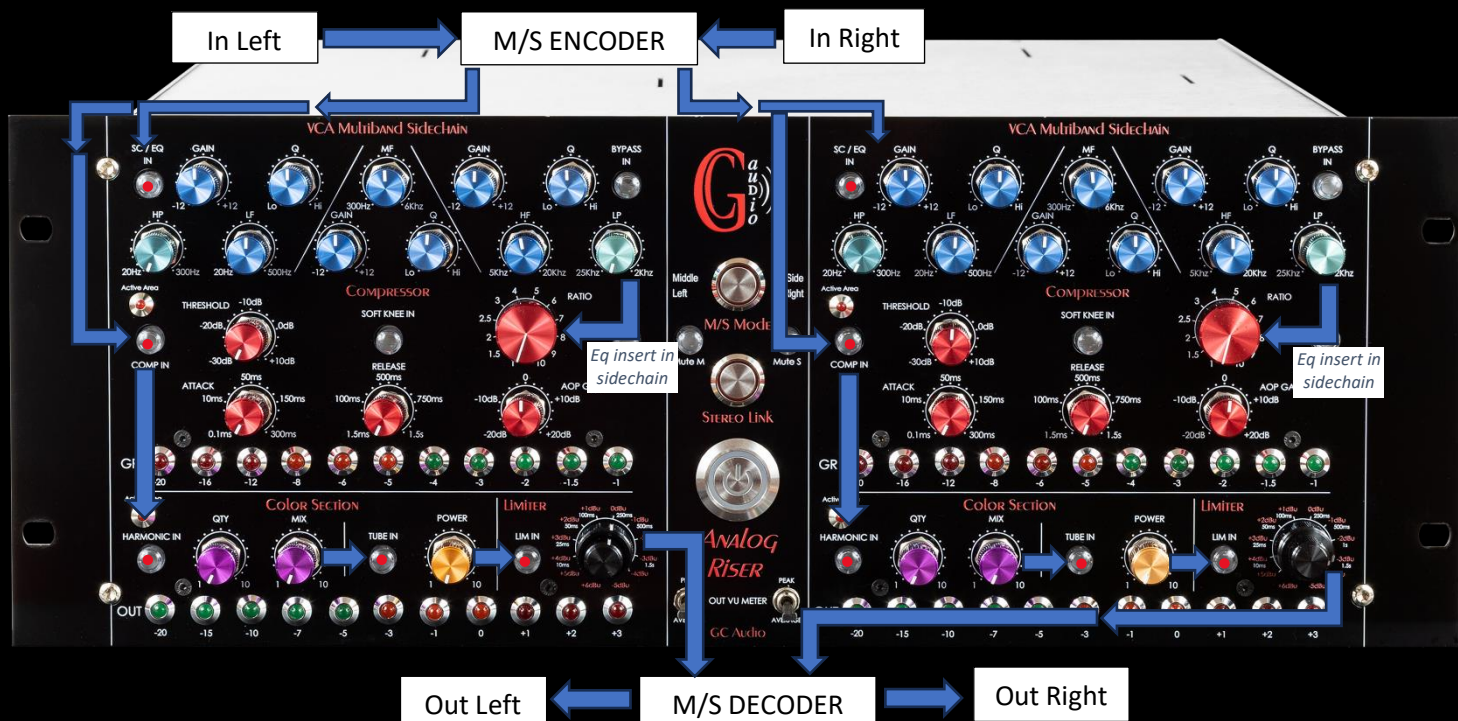
Note that in this configuration, it is sufficient to deactivate the compressor for monitoring the sidechain contour.

In stereo mode, it is not possible to have a stereo equalizer, this one being exclusively dedicated to the stereo compression contour.

### 3) M/S Mode (Mid/Side):

To activate this mode, after powering up the machine, simply press the "M/S" button. This mode dedicated to mastering is a very powerful tool that allows a different dynamic treatment between what is mixed in the center (Mid) and what is mixed on the sides (Side). The M/S encoder and decoder of the Analog Riser are built around dedicated differential amplifiers with laser-etched calibration, which allows for the most precise signal processing. This mode remains completely analog, without A/D - D/A conversion.

**Configuration A:** All stages activated. The left channel controls the signal in the middle, and the right channel controls the signal on the sides:



**Configuration B:** When all stages are active but the Compressor stage:



The M/S function of the Analog Riser is very powerful. It allows new settings where it will be possible for example to make-up the tube gain on the sides and a discreet make-up on the middle. The same goes for all other functions. In this mode, a large number of sound configurations are possible.

## TECHNICAL OVERVIEW

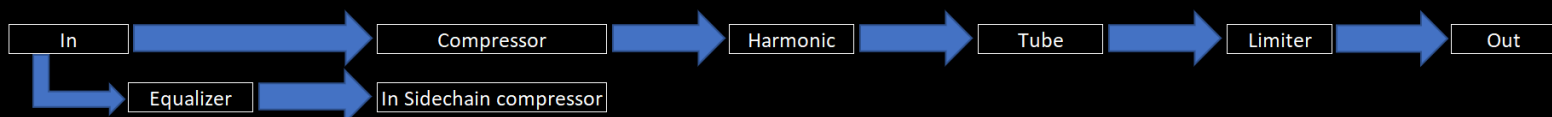
### The Analog Riser has 3 operation modes:

#### 1) Dual Mono Mode:

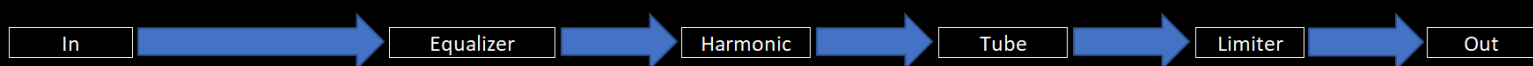
This is the default mode when you turn on the machine. It is a completely independent two channel analog processor. It is possible in this mode to simultaneously process two separate tracks in a mix.

As the device has many functions, it is necessary to understand its routing, which prioritizes dynamic processing above all. Please consider the following synoptic.

##### **Configuration A** : When all stages are active



##### **Configuration B** : When all stages are active but the Compressor stage



#### 2) Stereo Mode:

After switching on the machine, you just have to press the "Stereo" button. This mode is dedicated to the compression of stereo BUSSES.

The bus compression being generally positioned on moderate ratios, it was chosen a L+R summation for the Side Chain input.

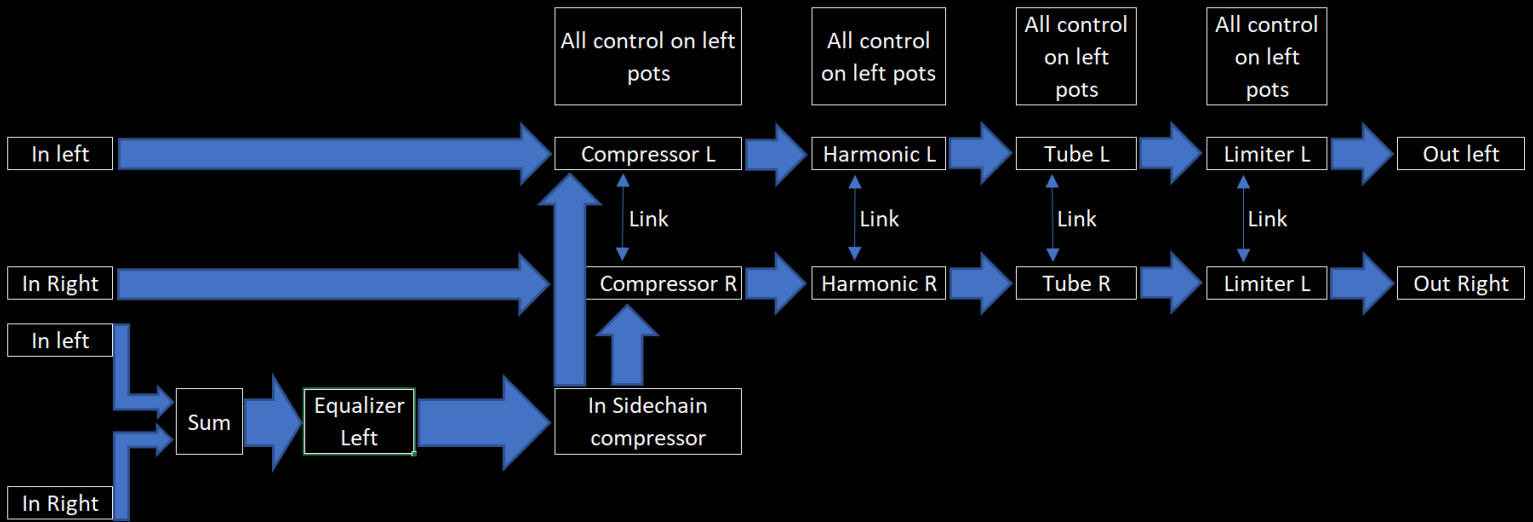
As the limiter works on a ratio of +infinity, it does not have any summation on the input of its side chain in order to keep a faithful stereo image. A common threshold, calibrated from the factory, allows a precise adjustment between L and R. Also a link of the VCA time control allows an identical behavior.

In this mode, all the control knobs are linked to obtain a very precise and identical adjustment between the Left and the Right channels.

An "Active zone area" LED allows to define the zones whose potentiometers are functional. Although the potentiometers are linked, the functions of the two channels work and to activate a function, it is necessary to switch it on both left and right sections.

The device having many functions, it is necessary to understand its routing which prioritizes above all the dynamic processing. Please consider the following synoptic:

**Configuration A : When all the are active**



Note that in this configuration, you only need to switch off the compressor to monitor the sidechain contour.

In stereo mode, it is not possible to have a stereo equalizer, this one being exclusively dedicated to the stereo compression contour.

**3) The M/S (Middle/Side) mode:**

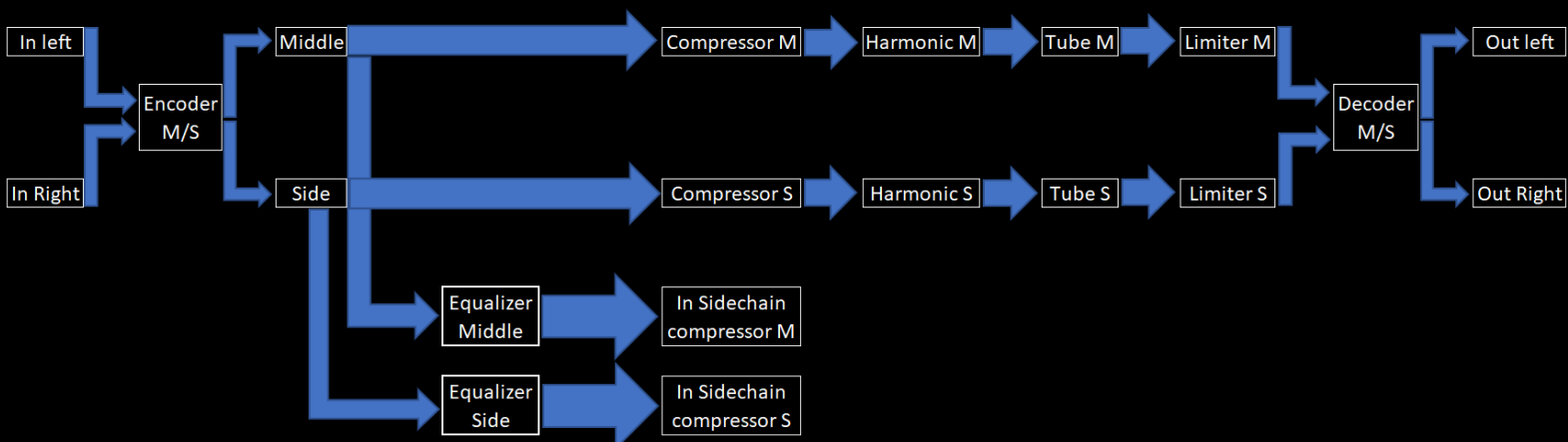
After switching on the machine, just press the "M/S" button.

This mode dedicated to mastering is a very powerful tool that allows a different dynamic treatment between what is mixed in the middle and what is mixed on the sides.

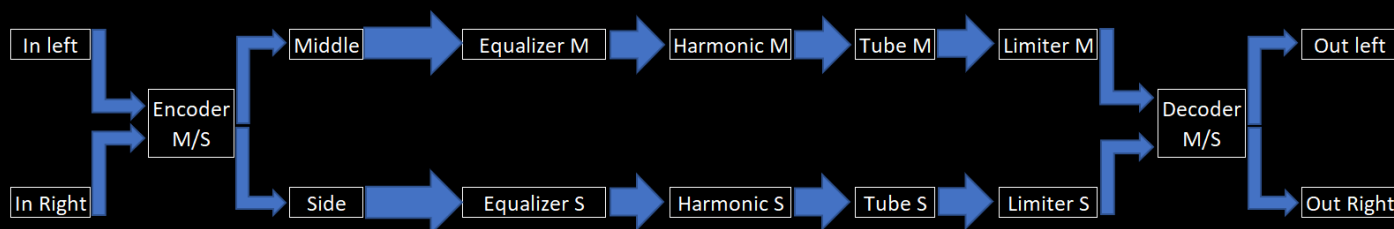
The M/S encoder and decoder of the Analog Riser is built around dedicated differential amplifiers with a laser engraved calibration which allows a very precise processing of the signal.

This mode remains completely analog, without A/D - D/A conversion.

**Configuration A : When all the stages are ON**



## Configuration B: When all stages are ON but the Compressor stage:



The M/S function of the Analog Riser is very powerful. It will allow you to make new settings where it will be possible for example to make a lamp Make Up on the sides and a discreet Make Up on the middle. The same goes for all the other functions. In this mode, a large number of sound configurations are possible.

### Position

This device is designed and tested to minimize internal electromagnetic emissions and provide immunity to external electromagnetic fields. To reduce the risk of performance degradation due to external interference, do not place this device near strong magnetic field sources such as power supplies, power amplifiers, speakers, etc.

### Rack Mounting

The unit is designed to be rack mounted to preserve the front panel finish. The front panel graphic layer is printed below the surface to provide a rugged, durable surface designed to last the life of the product in virtually any operating environment. Failure to use the provided fasteners may damage the faceplate surface, which may void the warranty. It is recommended that additional side brackets be used for rack mounting along with the front panel fasteners, especially when the unit is mounted in a case or vehicle where vibration and transport shock are to be expected.

### Maintenance

The product should be cleaned with a soft brush around the controls. If the front panel is dirty, use a damp cloth with a little household soap to remove the dirt. Do not use any solvent-based cleaners, as this could permanently damage the front panel and void the warranty!

### Audio Connections

Two 3-pin XLR and jacks connectors are provided at the back panel. The inputs are female, the outputs are male connectors. All connectors follow the European wiring convention: Pin 1 = Ground, Pin 2 = Hot (+) Pin 3 = Cold.

### Power

The GC Audio Analog Riser can be powered from either a 230V or 115V source via a switch on the rear panel. Do not open the Analog Riser, risk of electric shock.

## **Safety Instructions:**

- A) Caution - Earthing: This apparatus **MUST** be earthed. Under no circumstances should the mains earth be disconnected from the mains lead.
- B) Caution - Changing the Fuse To avoid the risk of fire: Replace only with same value and type of fuse as marked on the unit, 1A T (230V) or 2A T (115V). Before changing the fuse, always switch off the unit and remove the AC power cable.
- C) **WARNING** - For your own safety and to avoid warranty invalidation, please read this section carefully.
- Do not place the apparatus on an unstable surface.
  - Do not insert objects through any apertures.
  - Do not use this apparatus near water. Unplug the unit before cleaning.
  - Clean only with a damp cloth. Do not block any of the ventilation openings.
  - Install in accordance with the manufacturer's instructions.
  - Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus including amplifiers or power supplies that produce heat.
  - Do not defeat the safety purpose of the polarised or grounding-type plug. A polarised plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wider blade or the third prong are provided for your safety. When the plug provided does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
  - Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
  - Avoid using mains outlets on the same circuits as air control systems or other equipment that regularly switches on and off.
  - Only use attachments /accessories specified by the manufacturer.
  - Unplug this apparatus during lightning storms or when unused for long periods of time.
  - Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way such as the power supply cord or plug is damaged liquid has been spilled or objects have fallen into the apparatus the apparatus has been exposed to rain or moisture the apparatus does not operate normally the apparatus has been dropped.
  - Unplug the unit under these circumstances.
  - Adjust only those controls that are covered by the operating instructions.
  - Use only the mains lead provided with the equipment. Other leads may not have sufficient current rating.
  - Do not operate this unit with the cover removed.
- D) **Mains Cable** The supplied IEC mains cable must be terminated correctly to the AC mains supply before use. Use only an approved AC plug or power distribution device. The three cores are colour coded as follows: The Green/Yellow core in the mains cable is a safety ground and must be connected at all times!
- E) **115V/230V Operation** Before adjusting the operating voltage, always switch off the unit and remove the AC power cable! To adjust the operating voltage, use a flat blade screwdriver to click the voltage selector across to the required position until the legend 115V or 230V appears in the window and fit the appropriate fuse supplied in the fixings pack.