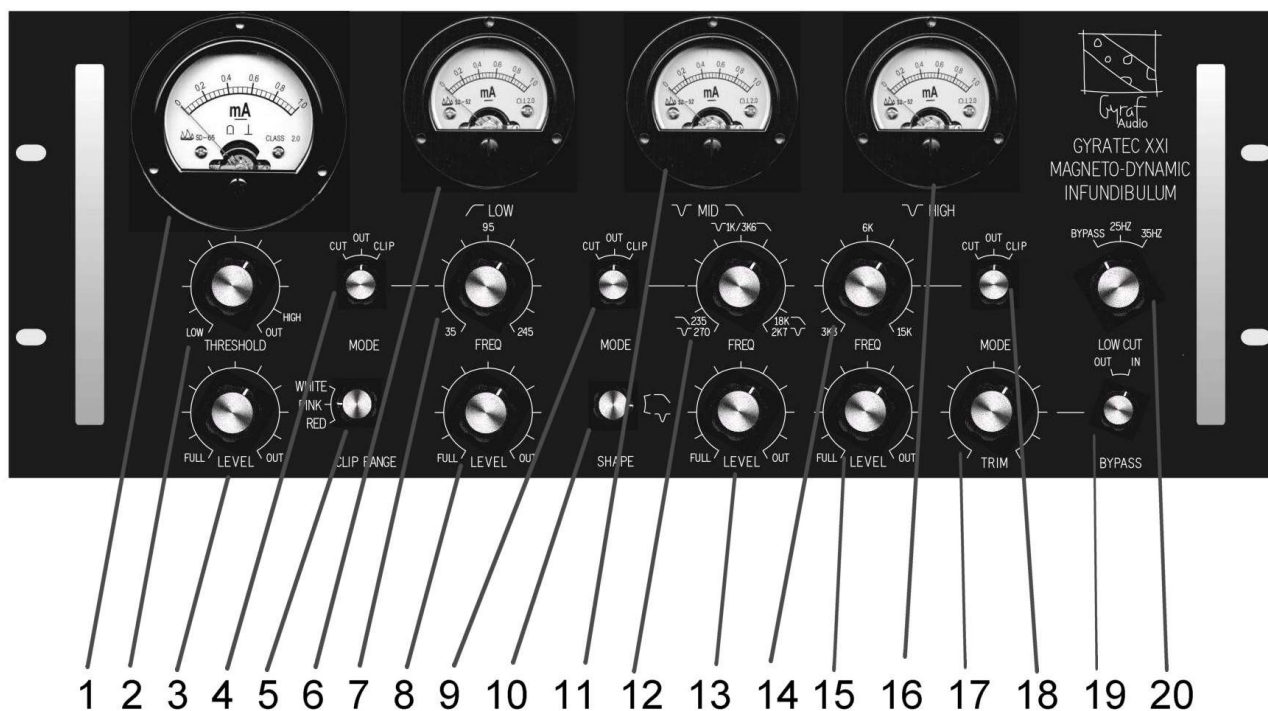


Gyraf Audio G21:



Gyraf Audio Gyratec XXI Magneto-Dynamic Infundibulum.

Preliminary user manual, 04. April 2013.

The Gyratec 21 is a true passive stereo soft clipper, based on paralleling multiple bands of frequency selective clipping with an overall clipper on top. It is primarily intended for time-constant-less dynamic control in mastering - but it has some interesting applications in recording, mix, and sound generation as well.

In use:

The features of the Gyratec 21 are as follows:

The inputs and outputs are floating transformer balanced, without galvanic isolation. Input impedances are rather low - down to a couple of hundred Ohms at extreme settings, so make sure that the unit driving it has enough juice to keep it happy. Most modern pro-audio solid state hardware will drive it - but don't expect consumer gear to do the job properly. The input connectors are standard 3-pin XLR jacks, pin2 hot, pin3 cold, and pin1 Gnd.

The "bypass" function switch (19) bypasses the unit for reference. This switch takes out all circuitry, and leaves only an input load to prevent levels from jumping wildly when disengaging.

The G21 architecture consists of first a 18dB/oct high-pass filter (20) that can be set to off, 25Hz or 35Hz. Use this for cleaning up your signal prior to further processing ONLY if you're confident that there is no important information down there. Surprisingly often there's not.

Then we have the overall clipping stage with overall clipping level control (3) and selectable clipping threshold (2). The overall clipper is efficiently out of the circuit if Level or threshold is turned up all the way clockwise. The clipping threshold consists of a variety of different types of diodes (Schottky, Tunneling, Germanium etc.) with gradually increasing Vf's - getting softer at threshold is raised towards clockwise.

The 'Clip Range' control (5) enables you to select a pre-emphasis curve for the overall clipping: often you don't want low frequencies clipped as hard as higher frequency content - use this control so set for either White (linear), Pink (3dB/oct) or Red (ca. 5dB/oct) pre-clipping emphasis.

The overall-clipping indicator meter (1) gives an indication of the processing happening - but please note that it is NOT calibrated in any relative value: It shows the actual current that is being sucked out of the signal, so a low reading on a relatively low level input signal can easily be knocking off more dB's than a high reading on a hot signal. This goes for the three frequency-selective band-clipping filter's meter readouts as well.

Next in line is the Low clipping band, consisting of a Level control (8) working pretty much like the one at the overall clipper, a Frequency selector (7) that dials in the range you want to work in from 35 to 245Hz, and a Mode selector (4) that allows individual hard-bypass of the band, and that selects the mode - either 'CUT' which gives you cutting like any subtractive passive EQ, or 'CLIP' which engages the clipping stage. The meter readout (6) shows you what's going on - same limitations apply as with the overall clipping readout meter.

The Mid clipping band (9-13) has the same set of controls - with the addition of a 'Shape' selector (10) that sets either bell or shelving function on the mid band. Note that depending on 'Shape' setting, the frequency range is different: From 270Hz to 2K7Hz for bell and from 235Hz to 18KHz for shelving mode.

The High clipping band is controlled by 'Mode'(18) - same function as on mid and low bands, ditto 'Level'(15) and it's 'Frequency' control (14) which ranges from 3K3Hz to 15KHz.

Last, the 'Trim' control that allows for a fine-tuning of the unit's output level, which occasionally comes in handy when matching converter input levels.

Note that the way we implement the passive clipping has a number of side effects that should be considered in use:

First of all, the range of maximum clip is limited to some 6-8dB at each band - the maximum obtainable 'Cut' is somewhat larger at extreme settings of the 'level' controls.

Second, there is no 'adding up' of adjacent bands - if you clip two bands at the same (or close) frequency range, you won't end up with double the attenuation - mainly the band with the lowest threshold setting will act on the signal. Or if you clip heavily overall, there may not be frequency content enough left to activate individual band clipping

Third, this unit (being *entirely* passive) depends on getting an adequate input level. Make sure that whatever you drive it with can output some +15 to +20dBu. For reference and if you don't know your absolute analogue output levels, read the all-clip band (all other bands bypassed): With an input tone of 1KHz, the large meter(1) shows 0.5mA shows at +10dBu input when set at Range(5)=White, Level(3)=full (ccw) and threshold at 3 o'clock.

Fourth, this unit is best driven from transformer-balanced, impedance-balanced or servo-balanced output stages. Driving from simple and primitive electronically balanced outputs sometimes results in slightly unpredictable action - specially the meters will occasionally show strange readings, like moving slightly even when bypassed. However, we've found no adverse effects other than increased difficulty in control (which is hard enough as-is).

Fifth, USE YOUR EARS. Yes, it's been said often enough - but in this case it's even more important: The G21 is so very different from anything else out there. Run the unit with care - this is in no way a fire-and-forget gadget: Many types of interacting non-linearities are at large, even a few in macroscopic time-domain because of heating and temperature coefficients. It can work brilliantly on some types of mixes, yet break up and distort on another very similar mix. If used gently, we have distortion- and crosstalk figures around that of a well-adjusted StuderA80 24/2" - but a much lower noise floor.

Technical:

This clipper is entirely passive - you're not required to supply it with power. Kinda makes it easy to do European and US versions :-). Transformers are used between in- and output interfacing, giving a true floating input impedance of about 500 Ohm (depending a lot on actual setting), and an output impedance of ca. 2K Ohm.

The clipping is done at the audio transformers - the clipping circuits just presents (in parallel) a complex impedance that loads the transformers magnetic field, resulting in various degrees of collapse in transformer flux - which in turn attenuates the passing-through audio

Sadly, no tubes were necessary for the basic G21 design, but we're working on a stand-alone biasing extension for it. Stay tuned.

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Important notice:

Do not open this unit, although there are no really high - or potentially lethal - voltages present inside. Refer servicing to qualified personnel.

You can safely remove the four rubber feet if you wish to mount this unit in a tight rack - please save the feet for future use. NOTE: The feet are the ONLY part that can safely be removed. Do not loosen any other screws!

This unit operates without any power supply or mains connection, and consumes thus about 0W. There is no mains fuse. The US-version is the same as the European.

For further questions, comments and wishes, please contact us at Gyraf Audio:

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Jakob Erland
Gyraf Audio
04. April 2013.



EU-overensstemmelseserklæring

Undertegnede erklærer herved, at følgende apparat overholder beskyttelseskravene i Rådets direktiv 89/336/EØF om elektromagnetisk kompatibilitet (EMC) samt Lavspændingsdirektivet LVD.

Identifikation af apparat

Kategori: Audio Clipping Equalizer
Fabrikat: Gyraf Audio
Model/type: Gyratec 21 Magneto-Dynamic Infundibulum.

Navn og adresse på underskriveren:

Jakob Erland
Gyraf Audio
Jægergårdsgade 152, 02F
DK8000 Aarhus C.
Denmark

Standarder anvendt til grundlag for erklæringen:

EN 55013, EN 55020, EN 61000-3-2, EN 61000-4-2 og EN 60065.

Bemærkninger:

CE-mærket angiver kun overensstemmelse med EMC-direktiv 89/336/EØS samt Lavspændingsdirektivet LVD.

Århus, April 2013



Declaration of EU-accordance

I, the undersigned, hereby declare that the following device observes the protectional demands stated in the Council's directive 89/336/EEC about electromagnetic compatibility (EMC) and the Low Voltage Directive (LVD).

Identification of device

Category: Audio Clipping Equalizer
Make: Gyraf Audio
Model/type: Gyratec 21 Magneto-Dynamic Infundibulum.

Name and address of the undersigned:

Jakob Erland
Gyraf Audio
Jægergårdsgade 152, 02F
DK8000 Aarhus C.
Denmark

Standards founding this declaration:

EN 55013, EN 55020, EN 61000-3-2, EN 61000-4-2 and EN 60065.

Remarks:

The CE-mark only states accordance with the EMC-directive 89/336/EEC and the Low Voltage Directive, LVD.

Aarhus, April 2013

A handwritten signature in black ink, appearing to read 'Jakob Erland', with a horizontal line extending to the right.