

ThrillseekerLA

MANUAL

revision 1.0

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1 Introduction

1.1. License

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1.2. Installation

Requirements:

- Win32 compatible system with SSE2 (or higher) instruction set support
- Tested and known to work in many VST compatible hosts

Put the DLL file contained in this archive in the VST plug-in folder of your host.

1.3. Overarching topics

Warning: Lower your listening volume while operating the plug-in to avoid hearing damage or damage of speakers or any other equipment.

Note: The plug-in contains a dedicated on/off switch (labeled 'ON') which must be powered *on* to run the module. It's a true bypass when switched *off*.

Usage tips:

- Use the 'ON' switch to toggle the plug-in on/off for A/B comparisons
- Use <ctrl> + mouse left click on a knob or switch to restore default position
- Use <shift> + mouse left click on a knob to fine adjust values
- Use this plug-in as an insert effect in any (mono or stereo) channel of your VST host
- Feed a separate audio signal into channel 3 and 4 of this plug-in to enable triggering the compressor by an external sidechain signal.

1.4. Credits

Thanks to Patrick Barca for contributing his out-standing UI artwork again!

Special thanks to “Andrew J” as well as to “Tor / www.audioteknikk.net” for sharing ideas, insights and DSP schematics!

And many thanks to all the beta testers of course.

2 Overview

2.1. At a glance

ThrillseekerLA – limiting and leveling amplifier

ThrillseekerLA is a digital stereo leveling amplifier with truly analog qualities. It not only offers highly program dependent and musical sounding compression behavior but also implements a sophisticated non-linear amplifier stage based upon an accurate stateful non-linear model. Both complement each other perfectly and this way the device is capable of re-creating a variety of “opto-electrical” compression characteristics but is also adding the weight and dimension we typically associate with an excellent analog audio signal path which is so much sought after.

This technical design was chosen to offer both qualities in combination: The compressor circuit itself avoids distortion in all cases and there is virtually no inter-modulation distortion, resulting in a way smooth and artifact free gain riding experience. Instead, harmonically related distortion products can be dialed in to taste with the compressor interstage model. This harmonics generator is based on a non-linearity with memory which enables creamy signal coloration duties. Processed audio becomes alive and vibrant and the subtle detail in depth and spatial imaging is the icing on top.

2.2. Reference



Main parameters

MIX LEVEL – If the DAW mixing process is performed at -18dB this option allows to adjust the plug-ins internal gain staging accordingly.

SC FILTER – This sidechain filter is modeled after a well known hardware unit and attenuates low frequencies while boosting the HF department at the same time.

SC ROUTE – In position “EXT” this allows external sidechain access by obtaining the sidechain audio information from channel 3 and 4. In position “INT” the main channels (1 and 2) are used.

INPUT – A plain linear input amplification control.

ATTACK – The compressor's envelope attack time control: The timing is program dependent and the displayed values are just rough indications.

RELEASE – The compressor's envelope release time control: The timing is highly program dependent and the displayed values are just rough indications.

IN-GR-OUT – Selects the operation mode for the metering display right in the center. IN grabs the signal after the INPUT dial, OUT after the OUTPUT dial and in GR position it displays the amount of gain reduction achieved by the compressor.

SC LOCUT – A gentle one pole (6dB per octave) low cut filter in the sidechain path. This one is always in at 20Hz to remove DC content from the sidechain but high-pass filtering up to 500Hz can be dialed in.

RANGE – This limits the amount of gain reduction by shaping the compression transfer curve. In leftmost position the transfer curve appears plain linear (and therefore no gain reduction is computed at all). Turning it clockwise seamlessly dials in more and more compression amounts.

OUTPUT – A plain linear output amplification control.

ON – A true bypass switch in (when in *off* mode).



The interstage section

INTERSTAGE - This activates the interstage section of the compressor which is a sophisticated non-linear amplifier stage. It is based on a stateful non-linear model which provides very smooth sounding harmonic distortion. Just turning this on already injects a leading 2nd order harmonic which dynamically responds to the gain reduction performance of the compressor.

If engaged, further more and detailed control is unveiled with the parameter set at the bottom of the interface. This lets you control further odd harmonic distortion amounts and to set the focus of the distortion to full spectrum or just to parts of the frequency spectrum. Therefore, this is a powerful coloring tool which allows to obtain a wide tonal variety within just one single device. The underlying technology goes way beyond any static waveshaping approach, but on the other hand, typical drawbacks of e. g. dynamic convolution based approaches - such as high latency and cpu consumption – can be circumvented.

Note: This interstage section does not saturate in a conventional, strict manner but injects additional harmonic content. Nevertheless, the transient response of the audio signal gets affected in a nice fashion.

SPECTRUM – this slider adjusts the spectral focus of the distortion. Available options are:

- FULL – Full spectrum mode which covers almost the entire frequency range.
- LF – A huge emphasis of the low frequency spectrum, great for changing the bass tonality and other drastic effects.
- 500 Hz – Harmonic emphasis is performed on the 500 Hz area which provides a tonality which is sometimes referred to as increasing the perceived "warmth" of a signal.

- 800+ Hz – This works mainly on the 800 to 1000 Hz range and can greatly contribute to the presence of bass instruments.
- 2-5 kHz – A great option to improve the presence and intelligibility of vocal performances or even complete mixes by adding some nice sheen on top.
- HF – Performs nicely as a HF exciter on rather dull sounding audio or in audio restoration situations, as an example. It is capable of adding that “expensive sheen” in the air band of a mix.

TRANSFORMER - using transformers in an analog audio signal path leads to some effects where the coupling between the stages becomes frequency dependent, which is a work-load dependent effect in itself. This is exactly what the TRANSFORMER option does. It gives the applied distortion some welcome "weight" and a frequency dependent dynamic response which is typical for transformer coupled circuits (e. g. vacuum tube circuits). This effect is audible only when the circuit actually creates THD.

The TRANSFORMER option also applies distinctive transformer style signal distortions to the lower frequency part **but only in the SPECTRUM modes FULL, LF and “500 Hz”!**

Important: To obtain the transformer based frequency and load dependent behavior the INTERSTAGE switch must be IN. On top, there must be already total harmonic distortion (THD) audible in order to hear that additional effect.

THD – This allows to adjust the odd harmonic content if the interstage is used. A level meter adds some visual feedback on how new harmonics are dynamically introduced.

Note: harmonic content may already be added before visual feedback appears, especially if the SPECTRUM is focused on the higher frequencies. The metering performance varies depending on the actual frequency content and the SPECTRUM settings.

2.3. Basic workflow

Always start with just the compressor itself and not the interstage. Adjust attack and release times just like on any other compressor, note how the gain riding changes when the input level increases (and therefore more gain reduction is applied). Adjust both the timings and the input level until “it's there”. Always compensate the output volume for best A/B test conditions.

Switch the interstage option in whenever some texture and additional color is desired. Start with THD in left position to just hear the 2nd order harmonic which is

already introduced now by the gain riding of the compressor. At very high GR amounts this can already be quite pronounced, so use with care.

2.4. Tracking and mixing

Tracking and mixing might benefit from the ridiculous fast timings which are offered for the envelope computation but special attention should be spent on the overall recovery behavior. Depending on the load in the circuit the recovery from gain reduction slows down the more it comes to zero GR. The effect is similar to opto-electrical panel based (vintage) gain reduction stages. Recovery can get really slow by this effect and getting the most out of such units requires to find their specific sweet spot for any particular audio material.

Tracking and mixing might benefit to a large extent from additional harmonic distortions, especially the 2nd order one. For example, when managing rather difficult audio material such as acoustic bass or vocal recordings this can greatly improve definition. Also, don't forget the sidechain filtering options in such cases.

2.5. On the stereo bus

A quick way to back up from too much compression amounts is the RANGE control option which can offer rather forgiving compression characteristics especially suitable but not limited to 2bus compression / program material. The curve looses its compression capability approaches zero at settings of ca. 20-30dB, very typical for some retro compressors back in the past. In a modern compressor design a similar effect is achieved with dynamic range limiting which allows to apply this in a rather controlled fashion from 0 to 100%. The result is a very fancy compression experience and allows to recover quite easily from too much gain reduction amounts.

2.6. About SC linking

Linking both channels in the sidechain path can be important on the stereo bus and is handled in two different ways within *ThrillseekerLA*, internally. The sophisticated linking algorithm maintains the natural transient response in the stereo field but also reduces problematic stereo image shifts in higher gain reduction scenarios.

In the compressor circuit, both channels are starting entirely unlinked until 1dB of gain reduction is performed. Beyond that, both channels are getting gradually more linked as gain reduction increases. However, this process is tweaked to still allow some fast transients to get through without immediately affecting the other channel.

During the harmonic distortion generation of the interstage amplifier both channels always remain unlinked (aka independent). The only link between both channels in the harmonics generator is some slight frequency dependent channel crosstalk, which is exclusively a static affair.

Note: A true dual mono mode is not supported (two completely uncorrelated signals on channel 1 and 2). However, since there is no two channel parameter layout offered in the interface this would not makes sense anyway.

2.7. Leveling and gain riding

To get the most out of this device one should understand that its gain riding characteristics are highly dependent on the gain reduction amounts which the unit can be driven into. Therefore, finding the sweet spot in a specific compression situation requires seeking the best gain reduction range in the context of the attack and release time behavior (which in return is gain reduction dependent).

This opens a vast variety of applications ranging from gentle “fairchild style” bus compression with just 1-2dB of gain reduction up to drum smashing at extreme gain reductions.

3 Addendum

3.1. About stateful saturation

[tbc]

3.2. Updates and further information

Refer to my Blog at <http://varietyofsound.wordpress.com> for some additional information and updates on this plug-in or leave a note there if any issues did occur.

Peace,
Herbert