

TesslaSE

MANUAL

revision 2.0

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1 Introduction

1.1. LICENSE

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1.2. DISCLAIMER

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1.3. INSTALLATION

Requirements:

- Windows compatible system with SSE2 (or higher) instruction set support.
- The software is tested and known to work in many VST compatible hosts.

Installation:

Put the DLL files contained in this archive into the according VST plug-in folder of your host.

1.4. OVERARCHING TOPICS

- Use the ON switch right in the middle of the user interface for handy 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.

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

2 Jump Start

2.1. TesslaSE AT A GLANCE

The original TesslaSE audio plugin was one of my first DSP designs aiming at a convincing analog signal path emulation and it was created already in 2006. In its release info it stated to “model pleasant sounding ‘electric effects’ coming from transformer coupled tube circuits in a digital controlled fashion” which basically refers to adding harmonic content and saturation as well as spatial effects to the incoming audio. In contrast to static waveshaping approaches quite common to that time, those effects were already inherently frequency dependent and managed within a mid/side matrix underneath.

TesslaSE is not a distortion box but rather focuses on bringing all those subtle saturation and widening (side-) effects from the analog right into the digital domain. It slightly colors the sound, polishes transients and creates depth and dimension in the stereo field. All the analog goodness in subtle doses. It's a mixing effect intended to be used here and there where the mix demands it. It offers a low CPU profile and (almost) zero latency.

2.2. NEW IN VERSION 2

With it's 2021 remake, TesslaSE mkII won't change all that but just polishing whats already there. The internal gainstaging has been reworked so that everything appears gain compensated to the outside and is dead-easy to operate within a slick, modernized user interface. Also the transformer/tube circuit modeling got some updates to appear more detailed and vibrant, while all non-linear algorithms got over-sampled for additional aliasing suppression.

The mkII version features:

- Streamlined internal gainstaging and output volume compensated processing.
- An updated transformer signal path model.
- Added fine control for HF frequency correction and stereo imaging.
- A slick and easy to use UI redesign.
- All non-linear parts of the plugin are running at higher internal sampling frequencies to minimize aliasing artifacts.

2.3. BASIC OPERATION AND ADVICE

Use this plug-in as an insert effect in any stereo or mono channel of your VST host. It can be operated both as a mono or as a stereo plug-in. Assure the ON switch in the middle of the plugin interface is in 'on' position (illuminated yellow). This toggles the overall plug-in operation (on/off).

Level your incoming audio so that the needle of the THD metering indicator on top of the plug-in shows some slight movement. Dial in amounts of the DRIVE knob to apply further saturation effects to your audio if wanted. Use the OUT knob to adjust the overall output volume as needed for handy A/B testing at equal volume levels. This is just needed if the internal gain compensation does not match to a 100%.

2.4. FINDING THE SWEET SPOT

TesslaSE performs best as a subtle audio effect applied here and there in a whole mix situation. Don't expect all your mixing problems to be solved by just some magic on the stereo bus – there is no such 'silver bullet' in audio processing.

If the THD meter of the plugin shows some needle movement between 3 to 6% it operates already in its sweet spot typically. More details on proper signal leveling can be found in the chapter about gain staging. Another approach is to just Increase DRIVE as needed until the unit performs audible distortion. If you already notice distortion then lower slightly the input volume to the plug-in or back off the DRIVE knob counter clock wise.

Tip: Use this type of setting to perform TeslaSE on several audio channels in your whole mix to improve slightly the overall sonic image and density.

3 Advanced

3.1. GAIN STAGING

TesslaSE is calibrated to a 0VU equivalent reference point of -18dbFS. If mix levels are actually lower, an additional amount of 24dB gain can be dialed in with the DRIVE knob. This additional gain is compensated for the output internally. However, if the actual output level does not 100% match the (perceived) input loudness level the OUT knob can be utilized to fine tune the output volume by +/- 3dB. In its 12 o'clock default position the output volume trim is 0dB.

3.2. HIGH FREQUENCY COMPENSATION

After the plugin has been loaded and in its default setting, TesslaSE provides an almost linear frequency response even if gain gets increased to quite some extent. However, the more total harmonic distortion (THD) gets introduced, the more additional harmonic content will be created and especially appear in the higher frequency register. The AIR knob can be utilized to fine tune the HF frequency response by +/- 3dB if needed. In its 12 o'clock default position this compensation is 0dB.

3.3. STEREO IMAGE CORRECTION

TesslaSE internally applies harmonic content creation not only frequency dependent but also by utilizing MS matrix processing. Within its sophisticated internal setup the additional harmonic overtones are also improving depth and width perception of any stereo audio material and can contribute to an improved stereo field localization. This effect can be fine tuned by the DIM (dimension) knob. Turning the knob clock-

wise increases this effect and vice versa. The 12 o'clock position is the default position.

3.4. ADDITIONAL SIGNAL COLOURATION

By engaging the blue switch showing the transformer symbol further signal path coloration gets added to the audio signal. There are four typical audio transformer distortions modeled but also 2nd order harmonic harmonic content creation takes place which resembles transformer coupled tube stage effects in the analog domain. Use this option to obtain a denser harmonic spectrum and also a way more fancy bass perception. Avoid this option if too much THD is an issue.

Note: This option covers both, the SBE and Phat switches in previous TeslaSE versions.



4 Addendum

4.1. THIS & THAT

- Use the device as if you would use the good old console to drive a signal into the sweet spot where it just appears slightly better.
- If just too much goodness is applied, just back it off with the DRIVE knob.
- TesslaSE mkII is not phase linear which prevents dry/wet mixing the output.
- The higher the frequency, the less additional harmonic content will be actually created by TesslaSE.
- The device includes a very accurate audio transformer signal path emulation including frequency and phase response, low frequency distortion artifacts and group delay.
- The very same circuit also adds 2nd order harmonic content.

4.2. CREDITS

There were so many requests to revive the old and rusty TesslaSE which I've once moved already into the legacy folder. Therefore a special thanks this time to all who engaged me to actually bring this update! Also I would like to thank the audio community for supporting me when starting releasing plugins back in 2007.

4.3. 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