Waves – Trans-X

Software Audio Processor

User's Guide

Chapter 1 – Introduction and Overview

The Waves **Trans-X** transient processor is a special breed of dynamics processor designed specifically for detecting and shaping the transient attacks of audio signals. This is useful for adding or reducing the punch or pluck of a certain instrument. Trans-X is also a great tool for shaping the impact of the impulsive transients vs. the continuous and sustained components of the sound.

While normal dynamics processors detect when the level goes over a certain reference level, the Trans-X detects when gain rises faster than a certain velocity reference; hence the signal can be low at times and higher at other times or even fade out gradually, and the transient attacks will still be detected and re-shaped as required.

Many times we face a situation where a sound doesn't transparently cut through the mix, although its frequency response and dynamic range are satisfactory. Other times the opposite happens: we need to tame the impact of the attacks of a certain instrument to focus its continuous and harmonic properties and reduce its rhythmic or impulsive attacks. Classic examples include a drum set that never sounds close enough and a bass drum track that kicks nicely when soloed but disappears when the other instruments join in. An acoustic guitar track usually presents a very distinct pluck or strum versus its rich continuous harmonics. The Trans-X is perfect for making it sound as if it were recorded with different microphone placements or pick material. A bassline track can enhance its rhythmic drive or tame it to become a "Virtual Fretless Bass" (see the factory presets).

To control the detection of transient attacks, Trans-X allows you to specify the *Duration* of the attacks you want to detect, and the *Sensitivity* to the attacks' amplitude. Only attacks shorter than *Duration* will be detected, and as the *Sensitivity* is lower, only attacks with higher amplitude will be detected.

To control the shape of your transient attacks, Trans-X allows you to specify the *Range* of gain adjustments, and the *Release* time for the gain to return to unity after the attack has ended.

Shorter attacks naturally have more impact and longer ones have less punch. It is necessary to adjust the Duration according to the program material and the nature of the attacks that you want to shape.

The Trans-X comes in two flavors, *wideband* and *multiband*. The wideband consumes fewer process resources than the multiband component. It detects attacks in the total program energy so it is especially useful for processing a certain single instrument or single track.

The Multiband plug-in splits the program to four bands by engaging three phase-compensated crossovers. The crossover design is identical to the Waves C4. In the multiband component you can specify a dedicated range and sensitivity for each band. This allows you to make better adjustment on a drum group auxiliary or a drum loop that needs improved punch.

Sometimes, using the Trans-X Multi on a single instrument, allows you to design the spectral nature of the transient, so you are shaping not only the attack but also the EQ of the transient. This process usually requires more careful adjustment but can yield results superior to anything else we have come across during the development of Trans-X.

The Trans-X has automatic level padding when the range is extended. The reason for this is that a typical application will be to boost the attacks on a signal that is already hot. Without the level padding this is sure to produce clipping and distortion instead of the desired punch and impact. The output level can be adjusted after the impact is satisfactory, and you can use the trim button to bring the output peak gain to the full scale.

The Trans-X can co-exist with other dynamics processors, such as compressors, expanders and limiters, and it can work before or after these processors in the signal path. It may seem that using a fast-attack compressor after the Trans-X will destroy all the good work of the Trans-X, but in reality it doesn't necessarily do that, and many times a lot of the punch survives post compression with the shortest attacks. The reason for this is that normal dynamics compression can't change the attack time of the instrument, which defines punch and impact; it can only lower its gain when the energy exceeds a certain threshold. The secret is that the detail and settings of compressors and similar devices can affect the punch regardless of using transient processing. Transient processing can also be quite effective post compression, expansion, limiting, etc.

The Trans-X is the mixing engineer's secret weapon for the articulation of transients as well as a handy tool for reaching the desired balance between the continuous and sustained vs. the impulse and transient. It is not designed for mastering or for human voice processing, although you may find creative uses that are beyond the scope of its intended applications.

Chapter 2 – Using the Trans-X

Although using the Trans-X is easy (there are only a few controls to set), there is still a range of subtle nuances and general functionality that gives complex results. The Trans-X comes with a set of factory presets that can serve as good starting points and are usually classified and named according to the application they were designed to carry out.

SETUP BASICS

The recommended technique for adjusting the Trans-X is to begin with extreme Range settings to adjust the rough and conceptual picture and then fine tune it by moderating the extreme settings to the desired effect.

The first step is to identify the element that needs transient processing. All elements can benefit from the multiband advantage but in many cases the wide band will simply do the trick. The general rule is that single instrument tracks that seem to have good EQ but just need transient extension or moderation, can do very well with the Wideband component, while mixed percussion, full drum kits and also wide-range polyphonic tracks will usually require the Multiband.

Here are some examples of such elements:

- Bass Drum that sounds good on its own but loses presence when it plays along with other instruments.
- A snare drum that doesn't sound close enough even when completely dry. Or that sounds too punchy and needs to be looser.
- A Drum loop that sounds somewhat worn-out or originating from an old and dull recording.
- A percussion track that needs focusing.
- An acoustic guitar that was recorded from too far away and needs to sound closer or vice versa.
- A Bass guitar or synth that needs to more actively drive the music with its rhythmic pattern.
- A piano or tuned percussion track (i.e. marimba, xylophone, vibraphone) has overly aggressive attacks.

The Trans-X factory presets include a preset for all of the above elements. Once you insert Trans-X, select the related preset from the Load menu on the Plug-in's top toolbar. Solo the track whose transients you are processing to hear it on its own. Take the Range to the maximum value and fine-adjust the duration and sensitivity to make the desired effect. If the sound seems grainy, try a longer duration and release time. Un-Solo and review the duration and sensitivity settings.

Note! When boosting the range, it is important to anticipate the drop in overall track level. You may then use the AutoTrim button to bring the output level back up to just below clipping. Moderate the range to fit your needs. This is best done by ear while listening to the actual program.

MULTIBAND CONSIDERATIONS

When you have a mixed percussion track or a full drum set it is obviously advantageous to use the Multiband component. You will immediately see how each band responds to the excitation of the sounds within its frequency range. Typically you will see the dynamic gain line jumping in the low bands for the bass drum kicks, the mid, high-mid for the snare drum, and the high band for the hi-hat. Sometimes, you will want to improve the punch of the bass drum and snare, while moderating the attacks of the hi-hat. You can do this by setting the crossovers so that the three lower bands have a positive "boosting" range and the hi-hat gets a negative "cutting" range.

Each band has an On/Off control so you can easily A/B compare between the effect on just one certain band by turning the others off. The On/Off does not shut out the audio in the band but it shuts off the transient processing.

Transient attacks usually have a wider frequency range than the sustained part of the sound and sometimes shaping the transients can be enhanced by spectrally shaping the transient process. For example, a certain bass drum needs help at the higher frequencies of its transient in order to cut through the mix, especially on small speakers. In this case you can insert the Multiband component on the bass drum track and set it so that the two mid bands both react to the bass drum's attacks and specify higher sensitivity and range for the higher of the bands that shape the transient attack.

Chapter 3 – Controls and displays

TRANS-X CONTROLS

**RANGE**: +18 to –24dB. Default: +6dB.

Range [12.4]

The range control defines the maximum gain adjustment possible. When set to +18dB, it means that it will boost up to 18dB more and never go over the range limit. The range is displayed on the graph as a purple area above or below 0 dB. Its boundaries are shown by a light purple color.

You can adjust the range from the graph by using the grab markers, the triangle to the side of the meter in the Wideband component, and each of the crosshair markers on the Multiband component.

**SENS = SENSITIVITY**: +10 to –10. Default: 0dB.

Sens [8.4]
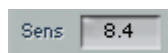
The Sensitivity defines what the amplitude of the attack should be in order to be detected. With a high Sensitivity setting, even small attacks will be detected, while a low setting ignores small attacks, and detects only large amplitude attacks. Too much sensitivity will begin to introduce continuous gain adjustment because it will be so sensitive that every upward fluctuation of the waveform will trigger it before it can reach any release.

DURATION: 0.01ms to 500ms. Default: 4.10ms.

Duration [2.93] Duration [2.16]

The duration control defines the Attack time of the transients that we want to shape or the velocity of the gain changes that we want to detect. Here, it is usually best to set a value that corresponds to what you would set as the attack time of a compressor. As a general rule, the longer the duration value, the more attacks that will be detected and processed. It is best to set this by ear in context and achieve the desired balance between Duration and Sens.

**RELEASE**: 0.50 to 500ms. Default:10.02ms.

Release 120.50
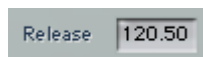
This is the release time for the gain adjustment. Once the detected transient is over, this is the time it will take the gain adjustment to settle back to 0dB. The release is actually not completely linear and in the multiband it is even scaled differently for each band.

OUTPUT: +18dB to −18dB. Default: 0dB.

-3.2 9.0 -4.3

The Output fader is located between the output meters and adjusts the gain of the overall output of the Trans-X.

TRIM: Click to Trim.

Trim 3.2
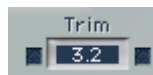
The Trim control is located between the clip indicators and shows the number that is the difference between the peak energy and the full digital scale or 0.0dBfs. When you click the Trim control, it will adjust the output gain by the indicated value. For example, if the Trim box indicates 3.2dB below full scale, then clicking it will increase the current output gain by 3.2dB. This is convenient for setting the best level for the plug-in output without clipping it.
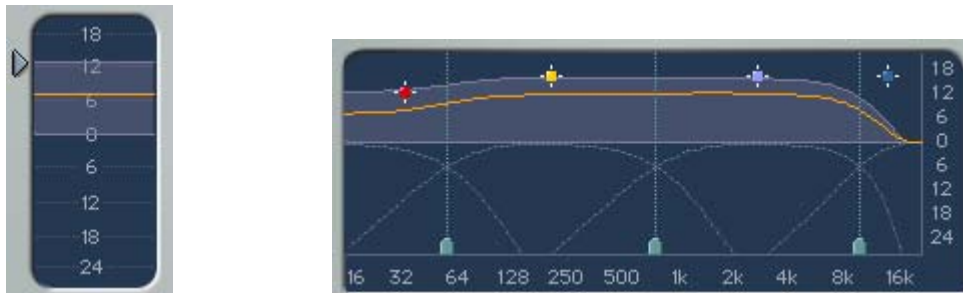
Multiband Only: Per band **ON/OFF**: Default: On.

On/Off

This will turn the Transient processing on and off for the related band.

TRANS-X DISPLAYS

GAIN ADJUSTMENT METERS:

The Trans-X Wide shows a gain adjustment meter where the range is indicated by purple shading and a yellow line represents the gain adjustment within the range. The Trans-X Multi shows a similar display with a dynamic gain line over the full band spectrum so that you can see how much gain is adjusted per each band.

OUTPUT METERS:

The output meters measure the top 30dB peak value. Beneath each meter is a peak counter that holds its peak value until reset by clicking on the meters.