NCL Phase EQ | User Manual

Professional Grade Equalization of the Stereo Image

Introduction

NCL Phase EQ is a high quality six band stereo equalizer which allows simultaneous left/right and mid/side processing. It is also more than capable functioning in a more traditional EQing role.

Phase EQ has been designed to be both powerful and flexible yet easy to use. Controls and parameters have been set up to steer users in the right direction without being restrictive in function.

To ensure a high quality signal with a low signal to noise ratio 64 bit precision is used internally on the entire audio path. Optional oversampling is available for increased audio fidelity.

Features at a Glance

- Windows VST
- 6 EQ bands
- 64 bit internal precision though out entire signal path
- Optional oversampling
- Simultaneous left/right and mid/side processing
- Optimized CPU usage

Equalization

Equalization is an important tool in audio production. It can be used either for corrective purposes, to subtly enhance audio or for more drastic creative uses.

One thing to remember is a little can go a long way. EQ is a very powerful tool and applying too much can be a quick way to ruin your tracks.

Below is a third party article on equalization which may be of help to those new to equalization or as a reference for the more experienced:

Equalization as a Stereo Effect

Left/Right Processing:

Independent EQing of the right and left channels can be used for different purposes:

Boosting and cutting different frequencies in the left and right channel can be used as a form of stereo widening or enhancement. This is probably best done with wide curves and relatively low gain.

Applied to a mix or sub-mix. EQing of specific frequencies can be used to move different elements around in the stereo field. For example by playing with the high frequencies it may be possible to reposition the high hats in the stereo field of a complete drum mix.

Mid/Side Processing:

Audio can be encoded so that instead of a standard left and right channel it is represented as a mid and side channel. The mid channel contains the mono signal and the side channel contains the difference between the left and right channel or the stereo information. This is cool as it provides easy manipulation of the stereo width.

Some possible uses of mid/side EQ are:

Focusing the Bass. Applying a high pass filter to the side channel ensures that the bass will only contain mono information. Vinyl recordings with wide stereo information in the bass can cause the needle to skip. This technique is therefore useful when mastering for vinyl.
Stereo enhancement. An EQ boost on the side channel will increase the stereo width of the affected frequencies. Cutting the mid channel will also increase the perceived stereo width.

User Interface

High Pass and Low Pass Controls:

HP indicates the High Pass Filter and LP the Low Pass. These filters have three controls each: **Freq** – Frequency. **Q** or resonance and **Mode**.

Freq:

This controls the cut off frequency of the filter. For the High Pass Filter Only frequencies above this will pass through the filter. The High Pass
Has a range of four octaves from 20 to 320 Hz. The Low Pass Filter only allows frequencies below the cut off frequency to pass through. The Low Pass also has a range of four octaves, but from 1250 Hz to 20 kHz.

Q:

Q controls the slope and resonance of the filter. Increasing the dial

above the half way position will start to add a resonant peak around the cut off frequency. The High and Low Pass Q controls have a range from 0.1 to 1.7.

Mode:

This control determines how the stereo image will be equalized. The High and Low Pass modes are Bypass (--), Left and Right (L + R), Left, Right, Mid and Side. **Bypass:** disables the band, also freeing CPU time. *L + R:* Both the left and right channel will be filtered. **Left, Right, Mid** and **Side:** Only the selected channel will be processed.

Please note that the mode control for the HP and LP filters works quite differently than for the other filter types.

Peak Filters:

Phase EQ has two Peak filters. They have five controls each. **Freq** - frequency, **Q** - bandwidth or resonance, **Gain**, **Mode** and **Position**.

Freq:

Boosting a peak filter creates a bell like curve centered at the frequency specified by this control. Both peak filters have a five octave range. The first filter (on the left) covers the low to upper mid frequencies - 80 to 2560 Hz. The second filter covers the low mid to high frequencies – 375 to 12000 Hz.

Q:

Controls the width of the peak filter. Higher values will increase the resonance of the filter – a result of a narrower bell curve. Lower values will sound less resonant and often less harsh due to a wider curve. The values for Peak filters range from 0.25 to 3.

Gain:

The gain control allows you to set the boost or cut of the filter. Peak filters can be driven up to 10 dB or cut to a maximum of -10 dB.

Mode:

This control determines what type of processing will take place. Peak filters have three modes **Bypass (--):** No processing will take place freeing up CPU time. **Left and Right (L + R)** and **Mid and Side (M + S):** The last two modes determine if the EQ performs left/right or mid/side processing.

Position:

This control affects the balance of processing between the two channels thus shifting the stereo position of the affected frequencies. In the center position both channels will be filtered equally. Turning the dial clockwise the ratio of filtering is altered so that the Right/Side channel (depending on the mode) is still processed at the level set by the gain, but the Left/Mid channel will be filtered with reduced gain. At half way clockwise Left/Mid gain will be reduced to zero. At fully clockwise the Left/Mid channel will be filtered by -1 x gain. The opposite happens when turning anti-clockwise.

The position control is much easier described visually:

| Mid = Gain | Left = Gain | Left = Gain | Mid = 0 | Mid = -Gain |
| Side = -Gain | Right = 0 | Right = Gain | Side = Gain | Side = Gain |

Shelving filters:

The Low Shelf (LS) and High Shelf (HS) filters share the same five controls as the peak filters. **Freq** - frequency, **Q** - resonance, **Gain**, **Mode** and **Position**.

Freq:

The Low Shelf filter will boost or cut all the frequencies bellow the center frequency by the amount set by the gain. It covers the four octaves from 30 to 480 Hz. The High Shelf filter will boost or cut all the frequencies above the center frequency by the amount set by the gain. It covers the four octaves from 1000 to 16000 Hz.

Q:

Q controls the slope and resonance of the filter. Increasing the dial above the half way position will start to add a resonant peak around the center frequency. The Low and High Shelf Q controls have a range from 0.35 to 2.25.

Gain:

The gain control allows you to set the boost or cut of the filter. Peak filters can be driven up to 10 dB or cut to a maximum of -10 dB.

Mode and Position:

These controls combine to determine how the stereo image is processed. They function exactly as described in the Peak filter description.

All numeric values for all controls can be directly edited by clicking on their read-out box.

The Metering Area.

There are three meters: Left Channel (**L**), Right Channel (**R**) and Phase Cancellation (**PH**). In addition this area of the GUI also contains Three controls: **VU - In Out**, **2X Sampling** and **Byp**.

Meters:

The Left and Right Channel meters display the levels of their respective channels. The ballistics are set up that attack times are very fast, but releases are quite slow. This allows the user to accurately judge peak levels.

The Phase Cancellation meter analysis the difference between the left and right channel. When this meter is full the right and left channels will cancel each other out fully when summed to mono. When the meter is empty it indicates a mono, or near mono signal.

This meter uses moderate attack and release times to give the user a good idea of the average level of cancellation.

Buttons:

VU – In Out: These two buttons are used to set the meters to display input or output levels.

2X Sampling: This button enables 2X oversampling of the signal. This will result in an increase in quality particularly in the higher frequencies.

Do you need oversampling? The difference with oversampling enabled may be very subtle depending on the source material and user settings and will more than double the CPU load.

Bypass: Enabling this button will bypass the entire signal path. This can be useful to quickly compare your EQ settings to the original Audio. Bypassing will also free up CPU time.

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Acknowledgments

DSP Development   - Matthew Lindsay
GUI Design   - Jonathan Style
User Manual   - Matthew Lindsay

Phase EQ was made using Synthedit however all sound processing modules were custom coded in C++.