DUY Shape

User's Manual

DUY Shape

DUY Shape is a new approach to sound enhancing based on DUY's exclusive FDWS algorithm.

Main features

- Exclusive FDWS (Frequency Dependent WaveShaping) algorithm processing.
- Three band smooth filter with full audio range continuous crossover points.
- High quality analogue sound filters using modelling technology.
- Three independent user-defined Shapers with virtually infinite resolution and accuracy. Each shaper has:
    - Eight different Shaper curve types including Linear, Log and cosine functions
    - Linear expand function to optimize dynamics.
    - A set of 5 factory presets for typical applications.
    - Simultaneous Input and Output plasma-like meters.
- Mix switch for only Low, Mid, Hi Shape or all (default) which allows easy independent adjustments.
- High signal to noise ratio due to internal 48-bit resolution and noise shaping in the lower 24 bits.
- Powerful and intuitive user interface.
- Save/load setup capability.

Applications

- CD and broadcast mastering.
- Suitable for processing any kind of sound: music, musical instruments, voices or effects.
- Processing of independent tracks or mastering final mixes.
- Processing possibilities include:
    1. Dynamic enhancing
    2. Smooth equalizing
    3. Waveshaping compression
    4. Frequency enhancing
    5. Sound "revitalizing" for old mixes
    6. User-defined harmonic redistribution.

1. About DUY Shape

DUY Shape is a new revolutionary approach to sound enhancing based on our exclusive FDWS algorithm.

DUY Shape will allow you to process any kind of sound: music, musical instruments, voices or effects on both individual tracks or final mixes.

Its processing possibilities include:

1) Dynamic enhancing.
2) Analog sound equalization.
3) Waveshaping compression.
4) Frequency enhancing.
5) Sound "revitalizing" for old mixes.
6) User defined harmonic redistribution.

Thanks to modelling technology DUY Shape also offers high quality analog sound within the digital domain. DUY Shape opens new possibilities of research to both musicians and studios.

2. About FDWS

FDWS stands for Frequency Dependent WaveShaping.

In short the FDWS algorithm process offers programable three-band waveshaping with full audio range continuous crossover points.

Each of its three independent user-defined Shapers also has virtually infinite resolution and accuracy. The highest signal to noise ratio is achieved due to 48 bit internal resolution and noise shaping in the lower 24 bits.

Shaper features include: eight different curve types, linear expand function, and a set of factory presets for typical applications.

3. Configuration and system requirements

DUY Shape can be configured both as a mono or a stereo device. The stereo mode is selected automatically when it is inserted into a stereo track. In stereo mode both channels are linked from the same front panel. Two "output level meters" appear automatically when in stereo mode. The stereo mode is transparent to the user and can not be overriden in any situation.

For up to date information about resource allocation on your platform please refer to the ReadMe folder on the installation disk or visit DUY's website at http://www.duy.com.

4. External controls

DUY Shape's front panel is divided into two main parts: the top push button menu and the plugin's main display.

4.1. Top push button panel

This menu varies according to the the program you are using. One common button to all applications is the Bypass.

Bypass.- By toggling the bypass you can make a comparison between direct and processed sound.

4.2. The shapers

The shapers are the core of the FDWS. A shaper is basically a user definable waveshape transformer, whose X axis represents the original input waveform and Y axis the desired output.

For a quick understanding of how it works, you can see the shaper curve as a kind of mirror. In linear shaping, illustrated by a straight line in diagram 1, the output exactly mirrors the input waveform. In non linear shaping, the curve in diagram 2, the input meets the line and then reflects a different output waveform.

We can make some conclusions about this: firstly in the linear case only volume changes are produced by moving the line's highest point.

Secondly, any curve placed over and above the linear shape will amplify the sound and introduce some kind of non-linearity.
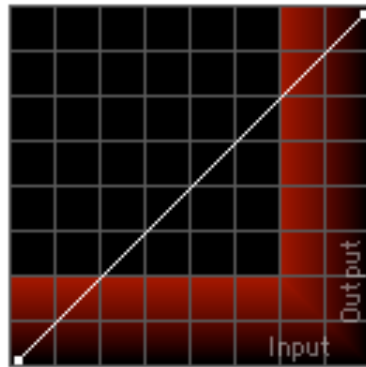

Diagram 1

And thirdly, any abrupt change in the shape, as in diagram 3, could produce heavy non linearities.

An expansion button scales the curve to its maximum possible energy. It does so by fitting it to the whole grid area. A reset button switches back to linear mode (45 degrees line). Each shaper has a plasma like level meter. For convenience the meter and the shaper readings are directly related to each other.
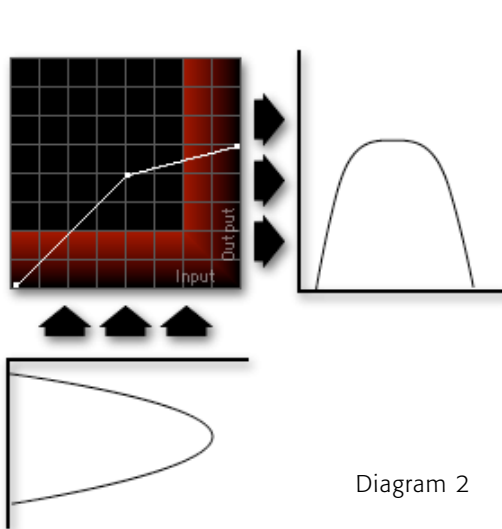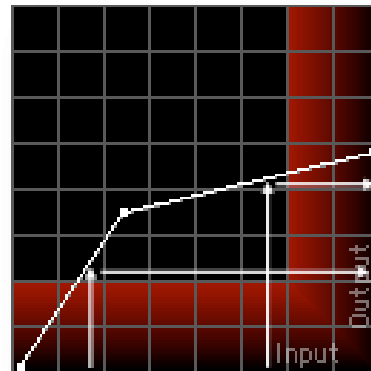

Diagram 3

Diagram 2

A Curve type selection offers you a choice of 8 diferent shape algorithms:

(1) Lin : segments are built using single straight lines.
(2) Cos: segments are built using cosine function curves..
(3) Log e: segments are built using logarithmic e function curves.
(4) Log 2: segments are built using logarithmic 2 function curves.
(5) Log 4: segments are built using logarithmic 4 function curves.
(6) Log 5: segments are built using logarithmic 5 function curves.
(7) Log 10: segments are built using logarithmic 10 function curves.
(8) Log m: segments are built by a sequence of different logically arranged logarithms, which depend on the current slope.

4.3. The filters

Three filters are provided before each shaper processor. Thanks to their fully complimentary response only two cut-off frequencies are needed instead of three. Frequency responses range from 0 to 1000 and from 1000 to 22050 Hz. A smooth response is guaranteed in all cases.

4.4. The Mix box

The mix arrow toggles between the three bands for independent monitoring. The toggle sequence is the following: Low, Mid, High and All.

4.5. Output level

The output level meter measures the peak level of the plug-in´s processed or unprocessed signal, depending on whether Bypass is on.

It can be used to optimize the settings. By checking the output level meter you can optimize the perceived level difference between the processed and bypassed signals with the same peak reading.

When DUY Shape is inserted into a stereo channel (stereo mode) a second level meter appears besides the first one for the Right channel.

5. How to use DUY Shape

Shape comes with a ready to use set of preprogramed curves. To use them, or store your own, you can use the Load and Save functions in the usual way. You can also use the supplied curves as a starting point for your own research. To make your own adjustments it is advisable to follow some simple rules.

There are two steps in FDWS set up. The first step is to choose the cut-off frequencies of the filters. These filters split the audible range into three bands, with no audible degradation. These bands must be chosen according to the frequency content of the track to be processed. This part of the DSP produces 3 (6 in stereo) split bands of the audio material, ready to be processed by its corresponding Shaper.

The second step is to create the three shapes (one per band) that best suit your application. To create a curve just click and drag its points to the desired parts of the grid. Clicking an existing point while holding the "option" key will erase that point. Clicking a new or existing point holding the "caps lock" key will move the point to 45 degrees or 1:1 input/output shape. As you move a point you will see a box with coordenates in dB of input vs. output. Any changes you make can be heard in real time.

The applications of this approach are limitless. From simple compression or expansion to frequency enhancement and revitalization.

For example, you can compress the low band while leaving the Mid and Hi bands untouched. In this case, just draw the low Shaper and leave the Mid and Hi parts untouched by pressing the Init button. You can also eliminate whole bands by drawing a zero Shape function. This can be done by drawing a horizontal line over the X axis thus making all points equal 0 (curve type must be linear and expand button disabled). In this way you can adjust the filters to find the cut-off points of the band to be eliminated from the audio path. To make adjustments band by band we have provided a mix toggle switch for Low, Mid and Hi Shape bands which allows easy independent adjustments. A default mix position allows all three bands to be mixed at the same time.

The plasma like meters allow you to see the energy content of each band.

The setup of the shaper is both powerful and dangerous. Avoid sharp curves, unless you want heavy distortion. Also, drawing near the bottom left hand part of the curve is not recomended. Experimentation is once more our best advice.

INPUT LEVEL

SHAPERS

THE MIX BOX

FILTERS

OUTPUT LEVEL

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