HarmBode

Inharmonic Bode Frequency Shifter

[RACK EXTENSION]
MANUAL
2018

FX device by Turn2on Software

Introducing a variation of a legendary analog frequency shifter.

HARMBODE shifts the spectrum of a signal by a fixed amount. BODE™ Shifter is not a pitch-shitfer, but allows you to shift inharmonics in Hz.

Sometimes it can sound like a ring modulator effect, but with **HARMBODE** it is possible to get an upshifted and downshifted signal.

HARMBODE can work in Scale Frequecny or Scale Note mode with filter Keytrack.

HARMBODE can use internal "SELF-SRC", or additional audio input as modulation sources, to modulate one of the main device parameters individually, or at the same time.

With some settings you can hear the effect known as "Barberpole flanger" as well as a 90 degree phase shifter.

The original analog ***Bode 735 Freq Shifter™*** was designed by Harold Bode in the 1960's and was also used in the Moog™ modular system. **HARMBODE** attempts to reproduce this Bode freq shifter™ in Reason Rack Extension format.

Today Freq shifters popular in world of guitar pedals and modular synths, in world of software synths and FXs.

Try the legendary freq shifter in your Reason rack today!

Visit us: Turn2on.com

THEORY OF BODE FQ SHIFTER

Pitch shifting uses delay with the clock on the output shifted up or down to change the frequency of the notes you're playing.

A **frequency shifter** is basically one half of a ***ring modulator***.
While a ring modulator takes an input signal and a modulation signal and produces the sum and difference frequencies, a frequency shifter produces only the sum frequencies, or the different frequencies. It outputs these separate frequencies and invoques fancy filtering.

When you turn up controls, you can get glissandos, barberpole flanging, or soft echos that seem to rotate around you.

Some refer to this effect as a ring-modulator, but it is not true. Its Bode Frequency shifter with Hilbert transformation effect (rotate copy of signal to 90 degrees). Frequency shifters can sound like bells because they shift inharmonics, which sounds exactly like ring modulation. In technical language it is known as **single-sideband modulation.**

It is arguably one of the most underrated and ignored effects in the industry.

If you blend a slightly shifted signal with the original signal you can get some phasing. The harmonic structure of the dry signal with the processed signal can sound as an inharmonic effect, much like a bell.

Freq shifters shifts up all frequency content up by the same amount, thus altering the frequency relationships. As example, the 100 Hz tone go up to 200 Hz, and the 200Hz tone go up to 300 Hz instead.

HARMBODE frequency shifter can shift all of the frequencies of the input signal with up, down, up/down, and down/up modes. These modes create dissonance to the incoming signal, breaking harmonic structure.

With frequency shifters it is possible to touch on other aspects of *Phaser effects*.

With variations of small and big shifts, it can break the harmonics of many instruments, but with many percussion style sounds, a frequency shifter can change the tone and the effect can be very musical.

Small shifts gave deep phasing effects, larger shifts with notes changes is break harmonic structure and create dissonance. Intresting to know the history - originally freq shifters was help to reduce mic feedbacks in halls.
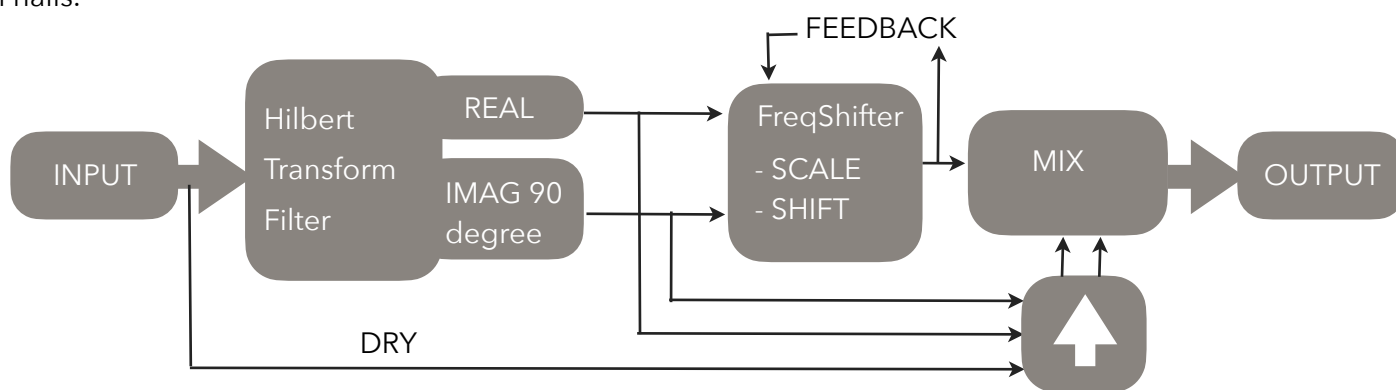
The effect uses a Hilbert Transform, that contains 2 seperate channels - Real and Imaginary. Real and Imag are summed after the Frequency Shifter block where they are mixed with the dry signal.

Note: Ring modulation is equivalent to double-sideband suppressed-carrier modulation, whereas a frequency shifter is equivalent to single-sideband modulation.

BYPASS - disable effect
ON - enable effect
OFF - mute incoming signal

FRONT PANEL

MAIN PARAMETERS

| MODE	**UP** - Shift frequencies upward **DOWN** - Shift frequncies downward, **UP/DOWN** - combination of Upward and Downward shift frequencies **DOWN/UP** - combination of Downward and Upward shift frequencies * Or left and right channels shift in opposite directions
SCALE MODE	Set Comb filter mode between the classic Frequency value and key note value. At the Note mode, avaliable to use Filter keytracking
SCALE FREQUENCY	Frequency shift in Hertz (not pitch shifting!). Low values result in **BARBER's pole phasing** when BLEND is set to 50%.
SCALE NOTE	Basic Note Keys steps identical to Hz values of Scale Frequency for filter keytracking
SHIFT	Linear scaling of shift amount with gradation. Can be inverted.
FDBK	Feedback adds overtones or increases SHIFT (depth) of phasing.
BLEND	Mix of incoming and processed signal

FREQ SCALE MODE (Hz)

NOTE SCALE MODE

Soft Bypass / Input Otput Corrections

BYPASS	Enable / Bypass HARMBODE effect. Soft bypass variant
INPUT	Amp gain correction of the dry input level (unprocessed input signal) before it goes to the BLEND (Dry/Wet) control
OUTPUT	Amp gain correction of the output level of the processed signal after it leaves the BLEND (Dry/Wet) control
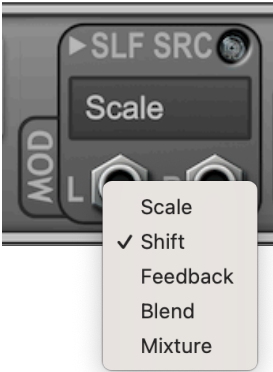
MODULATION CONTROL (rear panel)

| SELF-SOURCE MOD	An internal "Self-source" modulation source, that works as an Envelope Follower for incoming signal. Active if the LED is "On". To create a deep modulation effect, reduce Input level, and compensate for it by increasing output level
MOD AUDIO INPUT	Additional stereo audio modulation source input, that works as Envelope Follower. To have a deeper modulation effect, make your incoming audio signal source louder
MOD DESTINATION	Set the destination to one of the main device modulation parameters: Scale Frequency / Shift / Feedback / Blend / Mixture. Both of the modulation sources (Self-Source Mod & Mod Audio Input) can be used individually or at the same time

BACK SIDE PANEL

AUDIO INPUT/OUTPUT
Mono or Stereo connections for audio signals.

CV INPUTS
Use these CV inputs to control the main parameters with external CV source curves.
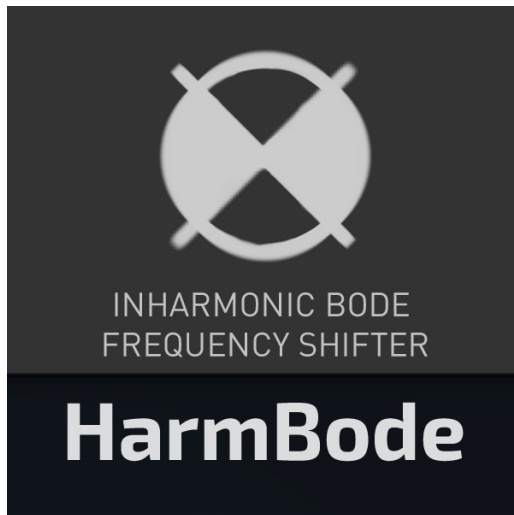
HarmBode

INHARMONIC BODE FREQUENCY SHIFTER

Reason Studios Add-on Shop

Thanks to all beta-testers

Turn2on

Rack Extension Developer

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