Controls

❶ Input

Is sent to the amplification stage (SHAPE) and mixed with voltage offset (SYMMETRY) and then to the two different wave shaping circuits.

❷ Shape

Is the amount of amplification of the input signal before it is inserted to the wave shaping stages. The first few degrees of the knob act as a regular VCA before the shaping is applied. CV at the SHAPE jack is attenuated and combined with the SHAPE knob.

❸ Symmetry

Sets the amount of voltage offset added to the input signal. When a signal is inserted to the SYMMETRY jack, the SYMMETRY knob acts as an attenuverter for that signal. When nothing is plugged at the SYMMETRY jack, it adds either positive (CW) or negative (CCW) voltage to the input signal. The SYMMETRY can be used with slow CV signals (PWM-ish character) or faster LFOs (pseudo chorus sound with wave folding), or it can be used to mix any second signals at the INPUT of the module. You can also take output of one of the wave shapers (I. or II.) and connect it to the SYMMETRY jack to get control over the amount of positive or negative feedback. In such configuration, the module might self-oscillate in certain settings.

❹ I. Wave Driver Output

Is an independent output of the I. WAVE DRIVER wave shaping stage. The signal in the I. WAVE DRIVER circuit first goes thru one wave folding stage (similar to the OK position of the II. WAVE FOLDER) with adjustable folding threshold and then thru the configurable overdrive stage. Adding voltage to the input with the SYMMETRY will result in asymmetric distortions which are typical for tube amps and are very musical. Adding a lot of SYMMETRY while using the folding stage can result in high-pass characters and elimination of the fundamental frequency.

❺ I. Wave Driver Switches

The DRIVE switch has 3 positions and can set the overdrive character to SOFT or HARD or something in between. This can also distort waveforms when using the wave driver to perform wavefolding.
The FOLD switch can set the folding threshold to HI or LO or it can turn the folding stage completely off in the NO position. The HI position sets the threshold for folding exactly twice as high as the folding threshold of the II. WAVE FOLDER circuit which can be used to obtain different harmonics at the respective outputs. Let's say the SHAPE is set so that the II. WAVE FOLDER folds the waveform twice (5th harmonic). At this point, with the FOLD switch on HI and the DRIVE switch on the mid setting, there should be only one fold at the I. WAVE DRIVER output obtaining 3rd harmonic. When SYMMETRY is applied, it is also possible to obtain 2nd and 4th harmonic or 2nd and 3rd harmonic at the same time at the respective outputs.

❻ II. Wave Folder Output

Is an independent output of the II. WAVE FOLDER wave shaping circuit. See II. WAVE FOLDER SWITCH for more details about the circuit.

❼ II. Wave Folder Switch

When a signal is amplified at the input of this circuit, it goes thru 5 stages. The first 4 are wave folding stages. When the signal gets amplified and reaches folding threshold, the peak that surpases that threshold gets folded inward. So instead of overdriving, it makes the waveform go downwards, instead of upwards. With further amplification, these peaks reach the bottom threshold of the second stage and fold upward again and so on in further stages. This can happen symmetrically for both positive and negative threshold with the FOLD switch in the OK position and the SYMMETRY knob centered. With simple waveforms, such as triangle or sine wave, this results in the introduction of 3rd, 5th and 7th harmonic, and further into sharp distortion. Sweeping the SHAPE would have a similar feel as tweaking the cutoff knob on a filter. Adding voltage to the input with the SYMMETRY will result in asymmetric folding and therefore 2nd, 4th and 6th harmonic can be obtained with the right portion of SHAPE and SYMMETRY.
Setting the FOLD switch in the NO position will result in skipping the 4 wave folding stages and using only the last folding/overdrive stage. This is especially useful when processing more complex signals.
Setting the FOLD switch in the KO position will make the folding stages strangely asymmetrical by default and will result in unique fuzzy metallic sounds.
The wave folding can result in losing the power of the fundamental folded frequency and therefore the X-FADE section is valuable for blending between the folded signal and the original or the overdriven signal which keeps the fundamental frequency. Such use is more similar to a low pass filter rather than band pass filter character for simple waveforms.

❽ FBK CV

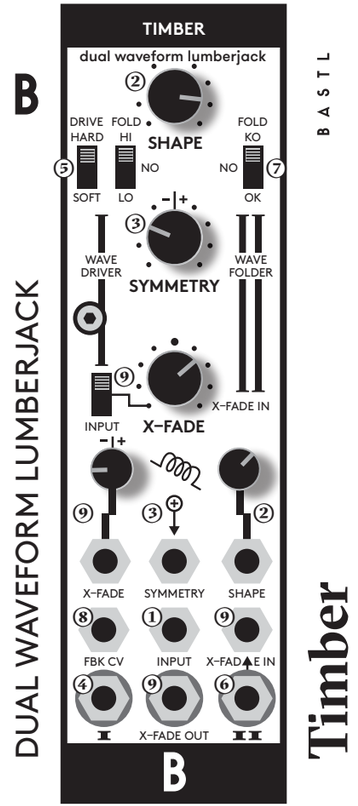
Voltage-controlled feedback can be obtained by applying voltage at the FBK CV jack. That takes a portion of the II. WAVE FOLDER signal to be mixed with the input signal. Especially with the FOLD switch in the OK position, it will result in chaotically aggressive timbres. It can also force the module to self-oscillate or create chaotic noises. The input will work great with 5V gates or envelopes. With higher amounts of SYMMETRY applied, it can multiply the voltage offset and make the signal go quieter in a specific way. This can be very useful when combined with more complex rhythmical modulations.

❾ X-Fade

The voltage controlled crossfader X-FADE is useful for combining the two waveshapers and for blending the wave shaped signal with the input signal.

The X-FADE knob sets the mixing balance of signals at the X-FADE output.
When set fully left, it outputs either the unmodified INPUT signal or the I. WAVE DRIVER signal, based on the setting of the SWITCH next to the knob.
With the X-FADE knob in the fully right position, the X-FADE outputs the signal that is present at the X-FADE IN jack. When nothing is plugged into that jack, the II. WAVE FOLDER signal is normalized there. With unrelated signals in, it can provide independent crossfade function.
Tip: Plug I. WAVE DRIVER output to the X-FADE IN and set the X-FADE switch to the INPUT position to crossfade between the clean signal and the signal affected by the I. WAVE DRIVER.

The X-FADE CV input goes thru the attenuverter KNOB which will mute the voltage in the middle position and will either add (if turned clockwise) or subtract (if turned counterclockwise) that voltage from the position of the X-FADE knob. This allows a positive envelope to crossfade in any direction between any signal combination.



Timber
dual waveform lumberjack

Timber is a very flexible wave shaping module that can produce rich timbres by adding harmonics to simple waveforms (triangle and sine waves) or any other signal. It has 2 different unique wave shaping circuits – I. the WAVE DRIVER (left side of the module) and II. the WAVE FOLDER (right side) – and a voltage controlled crossfader to fade between the different circuits or between one of them and the clean input signal.

Both circuits share the same control voltages: SHAPE sets the input amplification before the wave shaping circuit and SYMMETRY control adds voltage offset to the input signal to provide various asymmetric overdrives or wave folding sounds. There is also a FBK CV jack which, when provided with positive voltages, feeds respective portions of the output signal back to the input which results in chaotic and aggressive behaviours. It is calibrated to work well with 5V gate voltages.

I. - The WAVE DRIVER
is an overdrive circuit with one folding stage and it has two 3-way configuration switches (9 different configurations). The DRIVE switch can set the overdrive character to SOFT or HARD or something in between. The FOLD switch can set the folding threshold to HI or LO or it can turn the folding stage off in the NO position.

II. - The WAVE FOLDER
is a novel take on the Serge style wave folding circuit which cleverly uses the high gain of the input amplification stage to provide rich high frequency timbres with higher settings of the SHAPE parameter. It has a configuration switch to access clean 4 stage wavefolding in the OK position or highly asymmetric folding stage in the KO position that provides a strange metallic character. The NO position provides only the very last overdrive-folding stage.

Voltage controlled crossfader X-FADE is present to provide blending between different wave-shaping circuits or to work as a dry/wet kind of control. With complex waveshaping, the fundamental bass frequencies get often transformed into higher harmonics and therefore it is useful to be able to mix in a bit of the original signal.

features

- I. WAVE DRIVER is an overdrive circuit with one folding stage.
  - 3-way DRIVE SWITCH to set the character of the overdrive (SOFT-MID-HARD)
  - 3-way FOLD SWITCH to configure the folding threshold level (LO-NO-HI)
  - independent output I. OUT
- II. WAVE FOLDER is a 4 stage wavefolding circuit
  - 3-way FOLD SWITCH to set the character of the folding stages (OK-NO-KO)
  - independent output II. OUT
- common INPUT for both circuits
- SHAPE sets input amplification before the signal enters the waveshaping stages
- SYMMETRY adds voltage offset to the input signal
- SYMMETRY becomes a bipolar attenuator when the jack is connected
- X-FADE voltage-controlled crossfader with a bipolar attenuator
- switch to select between INPUT and I. WAVE DRIVER for the left side of the X-FADE
- X-FADE IN jack breaks the normalisation of the II. WAVE FOLDER on the right side of the X-FADE
- voltage at the FBK CV jack sends signal from the output or II. WAVE FOLDER back to the INPUT

technical details

- 7HP
- PTC fuse and diode protected 10-pin power connector
- 24mm deep
- current consumption: +12V: <50mA, -12V: <50 mA

application note

Different types of source signals work best with different kinds of wave shaping. Simple waveforms sound great with more harmonic content added and therefore using the wave folding in either stage gives strong results. Complex signals such as acoustic instruments or drums already have a lot of higher harmonics which when multiplied by folding stages can become quite noisy. Therefore, for such signals, more pleasing results may be obtained by applying overdrive rather than folding. There are no written rules for this process and ultimately the best techniques are those that sound best to the user. We advise the user to explore the many settings in conjunction with various kinds of input signals and modulation signals to experience the full potential of this powerful sound processor. Some combinations of signals and settings may show minimal results and some may sound less than pleasant but when a balance is struck, the outcome can be quite remarkable and loads of fun to explore…

⑩ ⑪ Open For A AC & Open For B AC

A AC jumper is specific to the I. WAVE DRIVER and B AC for II. WAVE FOLDER.
These jumpers are closed by default and make the TIMBER DC coupled all the way from input to output. This means it can (and should!) be used for processing slow voltage signals (sequences/LFOs/envelopes etc.). However, adding SYMMETRY might result in voltage offset at the output which might present some issues when used in audio signal path which is not AC coupled (such as connecting outside of the eurorack without output module). In such situations it is advised to leave these jumpers open.

⑫ INV A Phase

This jumper can be used to invert the phase of the I. WAVE DRIVER. When crossfading between the two shapers, this might result in high pass character because the fundamental frequency would be canceled out due to phase inversion. This might become handy in some scenarios while in some others it could be problematic..

⑬ Norm SHP CV_TO_MIX

Closing this solder jumper would normalize voltage at the SHAPE CV input to X-FADE CV input.

Connecting module to your system

Before connecting the ribbon cable to this module disconnect your system from power !

Double check the polarity of the ribbon cable and that it is not shifted in any direction. The red cable should be attached to the -12V rail, both on the module and on the bus board side!

please make sure of the following

- you have a standard pinout eurorack bus board
- you have +12 and -12 power rails on that bus board
- the power rails are not overloaded by current

Although we put protection circuits in the device, we do not take any responsibility for damages caused by wrong power supply connection.
After you connected everything, double checked it and closed your system so no power lines can be touched by your hand, turn on your system and test the module.