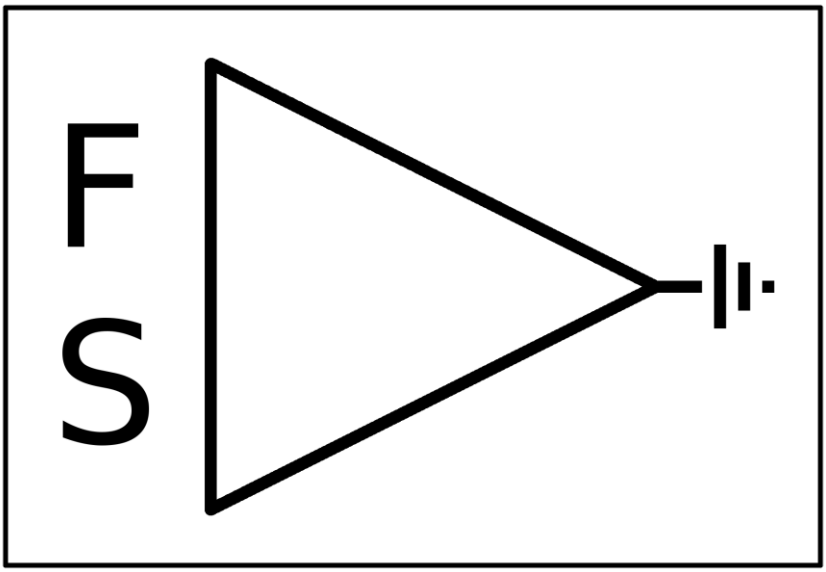
FORGOTTEN WAVE SHAPER

by Forgotten Clank Studios



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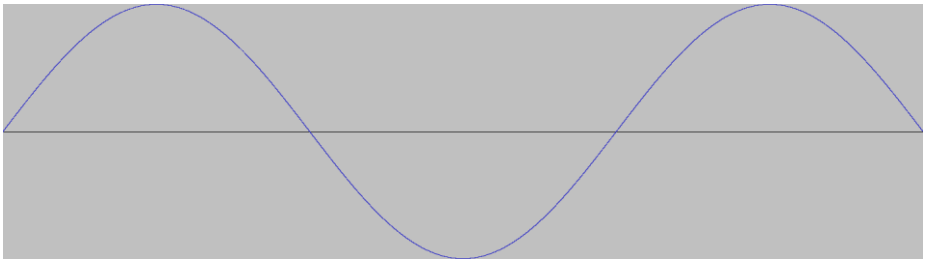
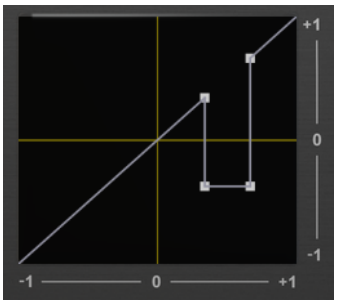
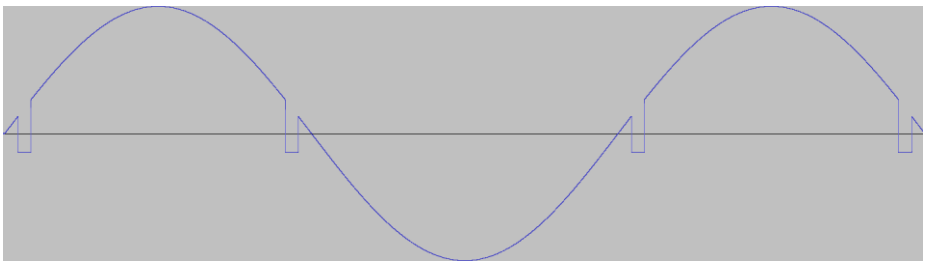
1) What is wave shaping?

Wave shaping is a form of distortion. The display on the Forgotten Wave Shaper shows an input-output-graph. Digital audio is represented by samples, single points of data that approximate the analog waveform. The points drawn into the display form a curve that maps the sample's value (x-axis) to some other value (y-axis). 0 represents –infinity dBFS (which is silence) while ±1 represents 0 dBFS (the digital ceiling). The sign doesn't make any difference to the perceived volume but it does enable you to draw separate curves for the positive and negative part of the waveform. The default 45° diagonal line therefore means no change in amplitude since 0 maps to 0, 0.5 maps to 0.5 and so on. The amplitude that goes in is exactly the same as the amplitude that goes out. Adding points near the center means changing samples that are of low amplitude while adding points near the corners means changing samples that are close to 0 dBFS. Drawn carefully you can model many different types of distortion.

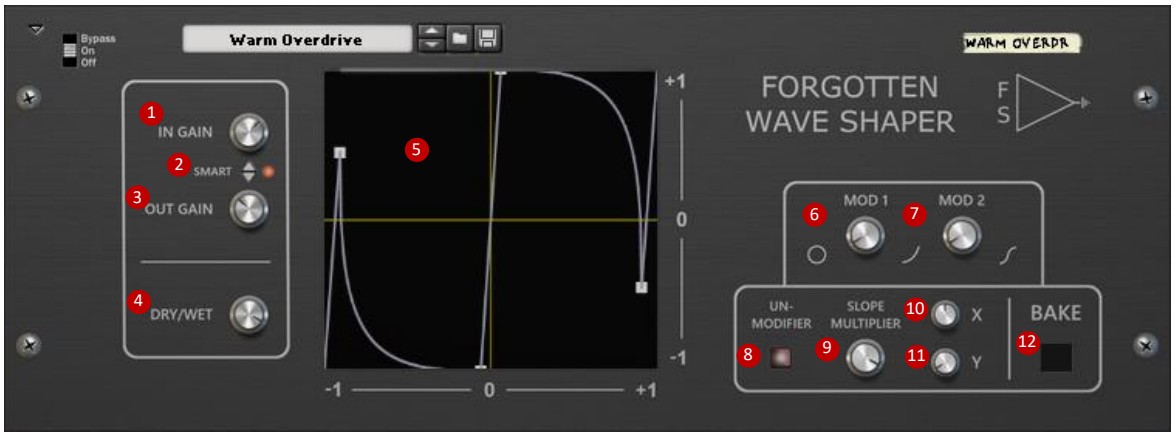




The parts of the waveform between about +0.3 and +0.6 have been mapped to a constant value

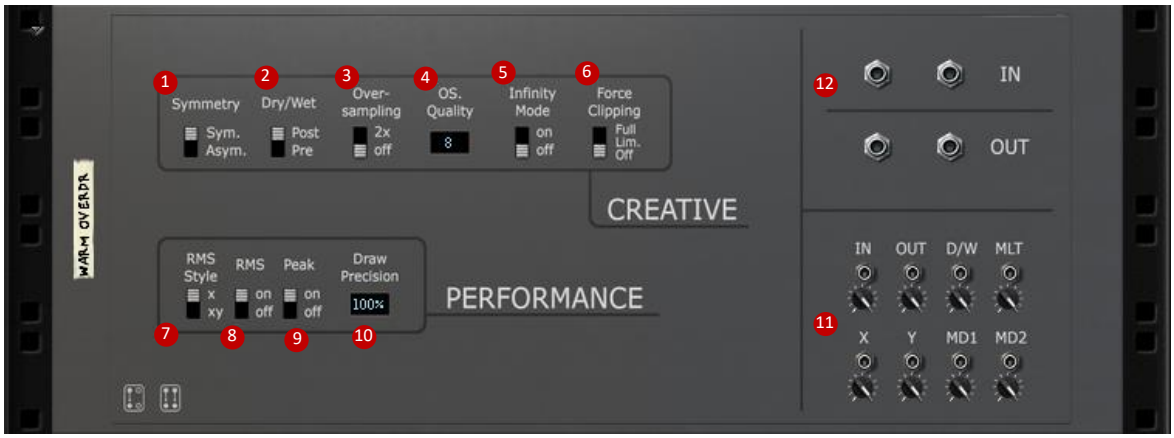


2) Front Controls



1	**In Gain**:	Amount of gain applied before any processing
2	**Smart Gain**:	Press the button to change the smart gain mode
	Light off:	no effect
	Light red:	automatically attenuates the signal by the amount of input gain applied
	Light blue:	tries to compensate for the increased loudness caused by the input gain and wave shaping
3	**Out Gain**:	Amount of gain applied after any processing and after the dry/wet knob by default, though the order can be changed by the switch on the back
4	**Dry/Wet**:	Balance between the unprocessed, dry signal and the processed, wet signal
5	**Display**:	Display where the distortion can be modelled
6	**Mod 1**:	Transitions between a circle-like curve and a polynomial
7	**Mod 2**:	Transitions between the blend of Mod 1 and an s-curve
8	**Unmodifier**:	Shows the display without the modification of 9, 10 and 11 and enables you to make changes
9	**Slope Multiplier**:	Changes the direction of the slopes
10	**x-Translator**:	Moves all the points further to the center (< 0.5) or further to the side (> 0.5)
11	**y-Translator**:	Moves all the points further to the top
12	**Bake**:	Permanently bakes the modifications of 9, 10 and 11 into the display

3) Back Controls



1	**Symmetry**:	*Symmetric Mode*:	50 points, mirrors points across the origin (center)
		Asymmetric Mode:	25 points, free drawing
2	**Dry/Wet Pre/Post**:	Switches the order of the output gain to be before (pre) or after (post) the dry/wet knob	
3	**Oversampling**:	Oversamples the signal to double the sample rate; this can lead to cleaner distortion as aliasing is prevented but also introduces a little bit of latency	
4	**OS. Quality**:	Determines the quality of the oversampling; higher values result in more accurate oversampling but increase latency	
5	**Infinity Mode**:	Repeats the shape drawn in the display above 0 dBFS	
6	**Force Clipping**:	*Off*:	No clipping
		Limited:	Clips the signal at the value of the point(s) that is/are nearest to the sides of the display; does not affect the signal above 0 dBFS
		Full:	Same as *limited* but also affects the signal above 0 dBFS
7	**RMS Style**:	Whether the RMS value should be displayed in as a rectangle or square	
8	**RMS toggle**:	Enables/disables the RMS meter	
9	**Peak toggle**:	Enables/disables the peak meter	
10	**Draw Precision**:	Determines the draw precision of the slopes and can improve performance while modifying points and/or slopes. This is only a visual change and will NOT affect the audio processing.	
11	**CV Inputs**:	CV inputs for all of the knobs on the front	
12	**Audio Sockets**:	Audio input/output	

4) Display Controls

Add point ----------	Shift + left click
Move point ----------	Click and drag
Lock x-coordinate ----------	Alt
Remove point ----------	Ctrl/CMD + left click
Reset slope ----------	Ctrl/CMD + left click
Slope fine control ----------	Left click + Shift
Move slope to 45° diagonal line	Shift + left click

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5) Tips and Tricks

- The wave shaping has the most obvious effect near the center but can have more interesting effects elsewhere
- Play with the input gain knob as it will greatly determine the sound of the patch
- Try using the “linked” smart gain mode (red light) with infinity mode and play with the input gain. It can have some really interesting effects
- The RMS meter (blue) can be an indicator as to where to place the points or whether the signal needs to be amplified more/less
- Using a saw-tooth wave you can use the Forgotten Wave Shaper as a waveform-drawing tool. The shape in the display will exactly be the shape of the waveform. This only works with one voice, though.
- You can reduce the DSP load by connecting mono sources only to the left input instead of using both inputs.

If you have any questions, requests, bug reports or would just like to say “hello” you can get it in touch at forgottenclank.studios@gmail.com or on Facebook. I would love to hear from you!