

*yohng.com'*

**BETABUGS<sup>TM</sup>**



**Version 1.0.0**

# Welcome

It is incredibly hard work to code a limiter with the ability to stop output dead at a user-specified level, and yet which retains gorgeous peak-shaping characteristics and a huge potential release delay. Harder still is to maintain transparency with extreme loudness maximization, with thresholds set as low as -30 dB. Hard work, indeed.

Even *more* challenging (as if we didn't already have our work cut out for us) would be to meet the standard set by George Yohng and his already legendary W1 Limiter, a user favourite for track and master volume limiting and “loudness” maximization. Frankly, it seemed a whole lot easier to contact George himself in the hopes that we could share resources. The result of that conversation is what you have just finished installing.

W1 Limiter is a clone of Waves L1, with identical output. From [Yohng.com](http://Yohng.com):

*I have not seen any Waves source code, and this result was obtained by tweaking [4Front YLimiter](#), by doing the following:*

- *Release curve simplified*
- *Release time multiplied 3 times*
- *Softening circuit filter changed*

George is already hard at work developing new professional-grade limiters which are sure to only improve upon his already impressive accomplishment. Commercial developers interested in licensing existing or forthcoming technology are encouraged to contact George at his website.

The BetabugsAudio edition of the W1 takes the same spectacular limiting engine and gives it a new interface, eliminating the need to control the plug-in from host default GUI as well as allowing the user to take advantage of other plug-in management features normally only available in certain hosts to GUI versions of plug-ins. The W1 interface follows the BetabugsAudio tradition of simplicity and elegance, while providing an inspiring appearance that matches the plug-in's form to its function. This new GUI, along with new documentation, offers the user an alternative way to enjoy the W1. We sincerely hope you like it.

## License

The W1 Limiter has a very simple license:

1. W1 is freeware. This means that you are free to redistribute it, give copies to friends, and otherwise share it around. However, only the entire unaltered archive, including this document, may be re-distributed.
2. Copyright of the code remains the property of W1's author, George Yohng. All elements of the GUI design remain the property of BetabugsAudio.
3. This plug-in is provided at no cost; therefore the author and BetabugsAudio assume no responsibility for any damage that may occur to the end user or the equipment used to run the plug-in.
4. Magazine editors are welcome to include this plug-in on a covermount disc or similar media; however, we request that a member of [BetabugsAudio](#) be contacted, as well as contacting George directly at [Yohng.com](#).
5. For all other purposes, please contact George Yohng for explicit permission.

## Feedback / Bug Reports

We are always eager to hear feedback or have bugs reported. The easiest way is to visit the Bughouse user forum, found at [BetabugsAudio.com](#). Because of the joint nature of this project, code-related bugs may be more quickly received by George Yohng by contacting him directly at his website.

If you would like to join BetabugsAudio in future beta tests, contact one of the team by [Bughouse](#) private message for details on getting started.

## Controls

W1 has three knobs for control, clearly labeled on the GUI itself:



**1 – Thresh:** This knob controls the *threshold* of the limiter's response to incoming audio, and ranges from 0 dB to -30 dB. As the knob is turned up, the perceived loudness also goes up, as audio is limited more aggressively.

**2 – Ceiling:** The *ceiling* is the maximum allowable level of audio passed by the W1. The ceiling may be set from -30 dB to 0 dB

**3 – Release:** One of the hallmarks of the W1 is its wide range of *release* time settings, which go from 1 ms all the way up to a staggering 5000 ms. As the release setting increases, so does the length of time that the limiter engine stays engaged.

*Note: The release time does not increase in a linear fashion. At '7', you will have reached 64 ms; at the 3/4 mark, 512 ms; and at '12', you will be at the W1's maximum 5000 ms release time.*

## How to Use the W1

With only 3 knobs, the BetabugsAudio edition of the W1 still packs a lot of power, variety, and functionality. Let's take a closer look so that we can better understand:

**Threshold:** When audio is passed to the W1, the first thing that happens is that the incoming level is compared to the *threshold* setting. If the incoming audio is below the threshold and the limiting engine is not currently engaged, then the W1 does nothing with it. Otherwise, the engine is engaged and incoming audio levels are limited to the threshold.

- *In Practice:* lower the threshold for “loudness maximization” tasks or to even out audio signals with excessive dynamic variety.

**Ceiling:** Once the audio levels have been compared to the threshold and limited, they are brought to the ceiling's level. In this stage, positive or negative gain is applied to the signal so that maximum output is no greater than the ceiling setting.

- *In Practice:* set this to whatever you want the maximum output level to be.

**Understanding Release time:** Once the limiter has been engaged, it will stay active for as long as the threshold continues to be exceeded. The moment the signal goes back below the threshold, the W1 may *release* its effect.

With a short release time, the W1 stops modifying incoming audio more quickly. With a long release time, the limiting engine will remain active for up to a staggering 5000 ms, boosting or limiting the signal to the ceiling. Of course, if the threshold is again passed, the cycle begins anew.

- *In Practice:* set to shorter times for peak limiting, or to longer times for sustain and flattening of dynamics

# Version History

1.0.0      First release!

## Credits

- GUI and all other graphical elements: Mully
- Programming and code: George Yohng ([www.Yohng.com](http://www.Yohng.com))
- Documentation: Greg Pettit

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