



CLA-2

Vintage Compressor

User Guide



Introduction

Welcome

Thank you for choosing Waves! To get the most out of your new Waves CLA-2A plugin, please take a moment to read this user guide.

To install software and manage your licenses, you need to have a free Waves account. Sign up at www.waves.com. With a Waves account you can keep track of your products, renew your Waves Update Plan, participate in bonus programs, and keep up to date with other important information.

We suggest that you become familiar with the Waves Support pages: www.waves.com/support. There are technical articles about installation, troubleshooting, specifications, and more. Plus, you'll find company contact information and Waves Support news.

Product Overview

About the CLA-2A

The CLA-2A is modeled on a hand-wired, tube-based compressor originally produced by Teletronix in the early 1960s. Initially intended for use in broadcast, the original device used an electro-luminescent optical attenuator called "T4" for gain reduction. Unlike many other designs, electro-luminescent circuitry doesn't add distortion when it modulates the sound. (Tubes, however, do, and we made sure to model that distortion.) Additionally, the inspiration for the CLA-2A's frequency-dependent attack and response speed made it an instant favorite of audio engineers. However, many consider its most unique feature to be its program-dependent, multi-stage release, which was achieved using a 2-stage photo-electric cell. With a Frequency Response of 30Hz to 15kHz (+/- 1dB) and < 0.5% THD, the original provided up to 40dB of gain limiting.

About Chris Lord-Alge

Grammy®-winner Chris Lord-Alge is the mixing engineer of choice for pop and rock royalty. His clients have included:

Green Day | U2 | Dave Matthews Band | Daughtry | Pink | Leona Lewis | Avril Lavigne | My Chemical Romance | All American Rejects | Nickelback | Rob Thomas | Snow Patrol | Ray LaMontagne | Miley Cyrus | Jonas Bros. | Tim McGraw | Faith Hill | Tina Turner | Rod Stewart | Celine Dion | Santana | Steve Winwood | James Brown

Chris has energized the sound of popular music. His hard-hitting mixes have transformed the radio soundscape and introduced a new sonic vocabulary along the way. His massive hardware arsenal includes racks and racks of the most coveted compression units in music history.

Widely known among audio pros and listeners alike for his punchy sound and extreme compression techniques, Chris gave Waves engineers exclusive access to model his most prized processors and worked closely with Waves through every phase of development. Together with many of his personal presets, these precision models deliver the distinctive sound of CLA's favorite classic compressors.

About the Modeling

Many elements contribute to the unique sonic behavior of analog gear. Waves painstakingly modeled and incorporated the characteristics of the hardware into the CLA-2A to fully capture and replicate the sound and performance of the original equipment. The hardware was modeled at reference levels of -18 dBFS = +4 dBu, meaning that a signal of -18 dBFS from the DAW to the hardware unit will display a meter reading of 0 VU (+4 dBu).

These are some of the most important elements of analog behavior:

Total Harmonic Distortion

Perhaps the most important analog behavior is Total Harmonic Distortion or THD, which is defined as the ratio of the sum of the powers of all harmonic components to the power of the fundamental frequency. THD is usually caused by amplification, and changes signal shape and content by adding odd and even harmonics of the fundamental frequencies, which can change the overall tonal balance. THD can also change peak output gain, usually by no more than +/- 0.2-0.3 dB.

Variable Release Times

In the original modeled hardware, a T4 optical device determines compression behavior. When strong signals are introduced to the compressor input, release time constants lasting several seconds may result. In certain cases, this may cause the same passage to sound different during successive playbacks, as the Release does not return to the unity position. This behavior is identical to that of the original hardware and should not be a cause for concern.

Hum

Waves modeled both 50Hz power current and 60Hz power current. If you listen closely, you will hear that there is a difference in hum level between 50Hz and 60Hz. Since hum is unique to each region and dependent upon local electrical conditions, you may find that the modeled hum is different than the hum already present in your studio, which may not be suitable for your particular use.

T4

In the original hardware units, the T4 optical device is responsible for the amount of overall compression and compression characteristics. These components are quite vulnerable to wear and tear, and need to be replaced—ideally, every 2 to 3 years. Depleted T4 devices result in up to 80% less compression as compared to newer components. During our research, we discovered that up to 90% of T4 components in use today have never been replaced. This means that most users are working with devices that compress far below the original manufacturer specifications.

If you are used to the performance and behavior of an original unit and you find that the modeled plugin provides more aggressive compression than you are used to, it may be that you have grown accustomed to a worn-out T4 component.

Components

WaveShell technology enables us to split Waves processors into smaller plugins, which we call **components**. Having a choice of components for a particular processor gives you the flexibility to choose the configuration best suited to your material.

The CLA-2A has two component processors:

- **CLA-2A Stereo** — Two-channel compressor, with one detector for both channel paths
- **CLA-2A Mono** — One-channel compressor

Quick Start Guide



The CLA-2A offers two main controls for compression, as well as additional controls for fine-tuning.

- Use the Compress/Limiter toggle to select Compressor (approximately 3:1 ratio) or Limiter (approximately 100:1 ratio).
- Use the Peak Reduction control to set the amount of compression desired.
- Use the Gain control to adjust make up level after the compression.
- Use the VU Meter to monitor Input, Output, and Gain Reduction levels.

Interface and Controls

Gain controls the makeup gain.



Range: 0 to 100 (in 0.04 steps)

Initial Value: 40.00

Reset Value: 32.28 (unity gain)

Peak Reduction controls the amount of signal compression.



Range: 0 to 100 (in 0.04 steps)

Initial Value: 46.00

Reset Value: 0

Please note: The scale is not linear and has been adjusted to conform to the exact scaling of the modeled unit. Thus, there may be more compression than expected at certain steps, as with analog gear (the most common peak reduction range of the LA-2A is between 30 to 50).

Auto Makeup coordinates Peak Reduction and Gain controls.



When Auto-Makeup is off, increased peak reduction (which is, after all, gain reduction) necessarily results in lower gain, so the gain must be increased to compensate. In the original CLA 2A, you adjust the balance between reduction and output gain by moving back and forth between these two controls until you achieve the desired compression/gain effect.

Auto-Makeup reconciles these two controls. As you increase peak reduction, gain will increase; lower peak reduction and gain will decrease. This results in a relatively stable output as gain reduction changes.

There are three considerations when using Auto-Gain:

- The Peak Reduction knob can control the Gain knob, but not the other way around. This allows you to achieve an ideal balance between gain and reduction and then apply a final tweak to gain.

- The motion of the Gain knob is not linear with respect to the Peak Reduction knob. When the Peak Reduction setting is low, the signal is not being reduced, so no makeup gain is needed. Once you raise Peak Reduction enough to engage the compressor, the Gain knob will begin to move.
- To readjust the offset between the two controls, turn off Auto-Makeup, change the relative values, and turn Auto-Makeup back on.

Compressor Mode selects compression or limiting.

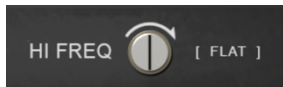


Range: Compress, Limiter

Initial Value: Compress

Reset Value: Compress

HiFreq increases voltage amplifier gain in the peak reduction circuit, for frequencies above 1 kHz, leaving lower frequencies unaffected.



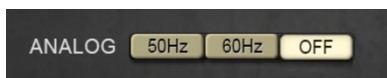
When this control is set to Flat, the CLA-2A will provide equal reduction to all frequencies. The more you move away from the Flat position, the less sensitive the compressor is to lower frequencies, resulting in less compression. This control may also be used as sort of a de-esser.

Range: 0 to 100 (in 0.1 steps)

Initial Value: 50.00

Reset Value: 100 (flat)

Analog controls analog characteristics caused by noise floor and hum, based on the power supplies of the original units.



Range: Off, 50Hz, 60Hz

Initial Value: 60Hz

Reset Value: Off

Mix controls the balance between the compressed and the uncompressed signal.

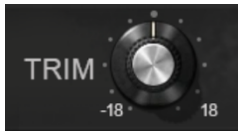


Range: 0% to 100% (0.1% steps)

Initial Value: 100%

Reset Value: 100%

Trim sets the output level of the plugin.



Range: -18 to +18 dB (in 0.1 dB steps)

Initial Value: 0

Reset Value: 0

There is one VU display meter for Input, Gain Reduction, and Output metering. The **VU Display Selector** toggles between these functions.



Range: In, GR, Out

Initial Value: GR

Reset Value: GR

The WaveSystem Toolbar



Use the bar at the top of the plugin to save and load presets, compare settings, undo and redo steps, and resize the plugin. To learn more, click the icon at the upper-right corner of the window and open the **WaveSystem Guide**.

Appendix: CLA-2A Controls

Control	Range	Default
Gain	0–100 (0.01 steps)	Initial Value: 40.00 Reset Value: 32.28 (unity gain)
Peak Reduction	0–100 (0.01 steps)	Initial Value: 46 Reset Value: 0
HiFreq	0–100 (0.1 steps)	Initial Value: 50 Reset Value: 100
Compressor Mode	Comp, Limiter	Comp
Analog	Off, 50Hz, 60Hz	Initial Value: 60Hz Reset Value: Off
VU Display	In, GR, Out	GR
MIX	0–100%	100%
Trim	-18 dB to +18 dB	0