MG9 AUDIO

CORE-X VEGA

The master-bus processor for loud, punchy mixes that translate everywhere.



USER MANUAL

VERSION 2.0.1

WINDOWS · MACOS

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1 Welcome

Core-X Vega sits on your master bus while you mix. It gives the mix the density, punch and loudness of a finished record, at competitive levels and in any genre, without pumping. Its meters show, honestly, how the mix will hold up on phones, laptops, clubs and streaming services.

The plugin has two sections:

- **BUS** shapes the sound and is always active. It holds a glue compressor that never pumps, upward density, bass translation, presence and air with safety nets, stereo width and warmth.
- **LOUD** makes it loud: a drive into a clipper split at 120 Hz, then a true-peak limiter. One click, **PRE-MASTER**, bypasses it when you deliver to a mastering engineer.

Each knob is an intention rather than a technical parameter: GLUE, DENSE, FOCUS, CLARITY, WIDE, WARMTH. The defaults are tuned starting points, not neutral settings.

What makes it different

- **No pumping.** The glue's release follows the programme: the mix does not rise again after every kick.
- **Relative, not absolute.** Thresholds and measurements follow the level of the song. The same music gets the same treatment, whatever level it arrives at.
- **Loud without losing punch.** Most of the loudness comes from an oversampled clipper split at 120 Hz. The limiter only takes the last 1 to 3 dB.
- **Bass that translates.** FOCUS adds the missing harmonics of the bass, so a sub that disappears on a phone keeps its pitch and weight there. It only adds what the bass lacks.
- **Honest metering.** Loudness to ITU-R BS.1770, true peak held by the limiter, mono loss, codec margin and streaming normalisation.

> **Core-X Vega is the new name of Core-X Lite 2.** It keeps the same plugin identifier, so sessions made with Core-X Lite reopen with Core-X Vega. Remove `Core-X Lite.vst3` before installing (section 2), and see section 12 for what changed.

2 Installation

Core-X Vega processes stereo only: insert it on a stereo track or bus, last on your master bus.

Windows

Requirements

- Windows 10 or 11, 64-bit.
- A 64-bit host that loads VST3 plugins: Ableton Live, Cubase, FL Studio, Reaper, Studio One, Bitwig and others.

Install

1. **If Core-X Lite is installed, delete `Core-X Lite.vst3` from your VST3 folder first.** Core-X Vega uses the same identifier: two copies in the same scan would confuse your host.
2. Unzip the download. If Windows blocked it, right-click the zip, choose *Properties*, tick *Unblock*, then unzip again.
3. Copy the whole `Core-X Vega.vst3` folder into `C:\Program Files\Common Files\VST3\` (or any folder your host scans).
4. Restart your host and rescan plugins if needed. Core-X Vega appears under **MG9 Audio**.

Standalone application

`Core-X Vega.exe` runs without a host, on your audio interface. Use it for quick listening tests; it is not needed to use the plugin.

Uninstall

Delete the `Core-X Vega.vst3` folder, then rescan in your host.

> An antivirus may quarantine a freshly downloaded plugin. If Core-X Vega disappears after the download, restore it from quarantine and allow it.

macOS

Requirements

- An Apple Silicon Mac (M1 or later) with macOS 11 or later, or an Intel Mac with macOS 10.13 or later. The plugin is a universal binary.
- A host that loads Audio Units or VST3: Logic Pro, GarageBand, Ableton Live, Cubase, Reaper, FL Studio, Studio One and others.

Install

1. Double-click `Core-X-Vega-2.0.1-macOS.pkg`.
2. macOS says it cannot verify the file: the installer is not signed by Apple, a paid service. Click *Done*, not *Move to Trash*.
3. Open *System Settings › Privacy & Security*. In the Security section, click *Open Anyway* next to the message about the installer, then confirm with your password. On macOS 14 Sonoma or earlier, you can instead Control-click the file and choose *Open*.
4. Follow the installer. It puts the Audio Unit in `/Library/Audio/Plug-Ins/Components` and the VST3 in `/Library/Audio/Plug-Ins/VST3`; *Customize* installs only one of them.
5. Restart your host. In Logic Pro, if Core-X Vega is missing, open the Plug-in Manager, select it and choose *Reset & Rescan Selection*.

> The approval is needed once, for the installer only: the plugin then loads normally. Never turn off Gatekeeper; *Open Anyway* is all it takes.

Which format?

Logic Pro and GarageBand use the Audio Unit, Cubase and Nuendo the VST3, and the other hosts accept both. Choose VST3 if you share projects with a Windows computer: the Mac and Windows VST3 share the same identifier.

Uninstall

Move `Core-X Vega.component` and `Core-X Vega.vst3` from those two folders to the Trash.

3 Quick start

1. **Insert Core-X Vega last on your master bus**, after any master EQ. Only metering or dither should come after it.
2. **Play the loudest part of the song and raise LOUD** until SHORT TERM reaches your target. Recent pop, hip-hop, rock and electronic hits sit around −9 to −6 LUFS integrated; acoustic and dynamic music lower.
3. **Watch the LIMITER module.** 1 to 3 dB of reduction is typical: the clipper does most of the work. If the limiter regularly takes more, you are asking for more loudness than the mix gives cleanly. Lower LOUD, or tame the peaks in the mix.
4. **Shape the sound with the six macros.** GLUE, DENSE, FOCUS and CLARITY start at their tuned 50%, WIDE at 30%, WARMTH at 0%.
5. **Mix with an eye on Input Health**, which shows the balance of the low, mid and high bands against commercial releases.
6. **Compare honestly.** MATCH LEVEL brings the output back to the input loudness, so you judge the processing rather than the volume. DELTA lets you hear what LOUD removes.
7. **Before you export:** switch MATCH LEVEL off, then choose CLIENT for a loud master or PRE-MASTER for a mastering engineer. For streaming, consider a CEILING of −1.0 dB (section 10).

> Hover any control or meter for a description. Double-click a knob to return it to its default.

4 The interface



1 **Input Health**: the balance of the incoming mix (section 7).

2 **View switch**: CONTROLS or MONITORING (section 9).

3 **BUS**: the six sound macros.

4 **LOUD**: drive, ceiling and peak mode.

5 **Output mode, DELTA, MATCH LEVEL**, with the input and output short-term loudness.

6 **Loudness**: momentary, short-term and integrated.

7 **Modules**: LIMITER, TRUE PEAK and DYNAMICS (section 8).

The window measures 1000 × 500 points and is drawn at the resolution of your screen, including high-DPI displays. The central panel switches between the settings (CONTROLS) and every measurement (MONITORING). The buttons at the bottom stay available in both views. The choice of view is remembered while the plugin is open; a session always reopens on CONTROLS.

Click the MASTER OUTPUT panel, or the details in MONITORING, to reset the maxima, the overs count and the integrated loudness.

5 Controls

Control	What it does	Range	Default
GLUE	Holds the mix together: depth of the glue compressor, whose release never pumps. Also sets the attack of the parallel density and the depth of the bass clipping. 0% turns the glue off. Called PUNCH in 2.0.0.	0–100%	50%
DENSE	Upward density. A true parallel compression lifts quiet detail, tails and quiet passages, never the peaks: up to +6 dB at 100%. 0% is neutral.	0–100%	50%
FOCUS	Bass that holds up everywhere. Progressive mono below 120 Hz for clubs and mono speakers, and the missing bass harmonics for phones and laptops, only where the bass lacks them. 0% leaves the bass untouched.	0–100%	50%
CLARITY	Presence (2 kHz) and air (12 kHz), up to +2 dB each. Three safety nets act only on faults: low-mid build-up, harshness and sibilance. 0% is neutral.	0–100%	50%
WIDE	Opens the existing stereo image through the side channel only, where there is room. The mono sum is untouched. 0% is neutral.	0–100%	30%
WARMTH	Warmth as studios mean it: weight and body in the low end, softer highs. 0% is neutral.	0–100%	0%
LOUD	Drive into the LOUD section: clipper split at 120 Hz, final soft clip, true-peak limiter. Inactive in PRE-MASTER.	−6 to +24 dB	0 dB
CEILING	Maximum output level.	−2 to 0 dB	−0.3 dB

Buttons

Button	What it does
TRUE PEAK / SAMPLE PEAK	**TRUE PEAK** (default) keeps inter-sample peaks under the ceiling. To do so exactly, the limited path is band-limited above 20 kHz (19.7 kHz at 44.1 kHz). **SAMPLE PEAK** holds only the samples: inter-sample peaks can pass, and those above 0 dBTP are counted as overs.
CLIENT / PRE-MASTER	**CLIENT** runs the full chain for a loud master. **PRE-MASTER** bypasses LOUD (no drive, clipping or limiting) for delivery to a mastering engineer; BUS stays active and the latency does not change.
DELTA	Listen to what LOUD removes from the driven signal: clipping and limiting. Never saved with the session.
MATCH LEVEL	Brings the output back to the loudness of the input (trim −60 to +12 dB) for a fair comparison. Click again for the full master level. Saved with the session.

> While MATCH LEVEL applies a positive trim, the ceiling is no longer guaranteed. Switch it off before exporting.

6 How it works

Input › Input Health › Glue › Density › Warmth › Presence and air › Wide › Clarity safety nets › Focus › Drive › Split clipper 120 Hz › Final soft clip › True-peak limiter › Match Level › Meters

Blue: BUS, always active. Red: LOUD, bypassed in PRE-MASTER.

Bus glue (GLUE)

A stereo-linked VCA-style compressor: 2:1 ratio, 6 dB knee, 30 ms RMS detector. Its threshold follows the level of the song rather than a fixed level. That reference rises in 3 s, falls in 12 s and holds during silences and breaks. The release depends on the programme. A slow branch carries the average reduction, and a fast branch handles transients. The mix no longer swells back after each kick: with the single 150 ms release of preview 1.9.1, a kick-heavy mix moved 5 dB in time with the kick; outside the masking of the attack, it now moves 1.2 dB. At 50%, the threshold is 5 dB under the reference; at 100%, 8 dB. The glue holds the mix together; it does not push the kick and snare forward. It has no make-up gain, so more glue lowers the level going into LOUD: compare settings at equal loudness.

Density (DENSE)

A true parallel compression computed in the gain domain: a 4:1 compressor with a relative threshold, mixed back under the dry signal. Quiet passages rise by up to 6 dB while peaks stay where they are, so the clipper works less for the same loudness. It uses no filter and adds no latency, and it is exactly neutral at 0%.

Warmth, presence and air

WARMTH blends in a 100 Hz low shelf (+2 dB at 100%), a broad 250 Hz bell (+1.5 dB) and a soft 5 kHz high shelf (−3 dB). CLARITY adds a 2 kHz bell and a 12 kHz shelf, +1 dB each at the default.

Clarity safety nets

Three dynamic EQs that only react to faults, measured on the mid channel, relative to the rest of the mix:

- low-mid build-up (cut at 320 Hz, at most 3 dB);
- harshness (3.5 kHz, at most 3 dB);
- sibilance (7 kHz, at most 4 dB, the side channel left untouched).

A normal mix rarely triggers them.

Wide

Four bells on the side channel (600 Hz, 1.3 kHz, 2.8 kHz and 9 kHz). Each one widens only where there is room, less on panned sources than on ambience. The mid channel is never touched, so the mono sum stays exact.

Focus

Below 120 Hz, the side channel is reduced progressively: −6 dB at 50%, mono at 100%. FOCUS also adds harmonics 2 to 5 of the bass (144 to 700 Hz), generated from the phase of the bass itself and dosed adaptively: an 808 sub receives them, a bass guitar that already has them receives nothing. With an 808 sub at 50%, a laptop speaker plays it 9.9 dB louder, at the right pitch.

LOUD

The driven signal is split at 120 Hz (Linkwitz-Riley). The low band clips 2 to 3 dB under the ceiling, the rest at the ceiling, then a soft clip 0.5 dB above the ceiling rounds the sum. All of it runs at 352.8 kHz or more (8× at 44.1 and 48 kHz). The limiter that follows looks 3 ms ahead and detects true peaks on 8 phases.

7 Input Health

Input Health shows the balance of the mix arriving at Core-X Vega in three bands, against what commercial releases usually contain. Nothing is applied to the sound: it is a guide.

- **Relative reading.** Each band is read in dB against the short-term loudness of the mix. The reading does not change with your fader or with the level arriving at the master bus.
- **The bar** follows the band level over 300 ms. **The value and the state** follow its share over 3 s, the window of short-term loudness.
- **CF** is the crest factor of the band. **CRUSHED** means the band has lost its peaks: look for heavy compression or limiting on the instruments of that band.
- **IDLE** means the input is below −60 LUFS.

Band	Green zone (dB, relative to the mix)	Minimum crest factor
LOW, below 120 Hz	−11.5 to −5.5	1 dB
MID, 120 Hz to 4.8 kHz	−7.5 to −1.5	5 dB
HIGH, above 4.8 kHz	−22 to −14	4 dB

States: **PERFECT** inside the zone with healthy peaks, **TOO QUIET** under the zone, **TOO LOUD** above it, **CRUSHED** when the crest factor is too low.

Where the zones come from

Elowsson and Friberg (2017) published the average spectrum of 12,345 commercial releases. They also published it by how prominent the percussion is. Read through Input Health's own filters, the average release gives LOW −10.7, MID −3.6 and HIGH −19.9 dB. The most rhythmic releases give −8.0, −4.2 and −17.5 dB. The LOW and MID zones contain both. The HIGH zone was set in version 2.0 so that it contains them too.

> Genres built on heavy sub-bass (trap, dubstep) can legitimately read above the LOW zone, and sparse acoustic recordings below it. Mud around 300 Hz and harshness around 3.5 kHz fall inside MID: CLARITY's safety nets take care of them.

8 Master Output

Loudness

Momentary (400 ms), short-term (3 s) and integrated loudness, to ITU-R BS.1770. Integrated loudness covers the whole playback since the last reset, with the standard gating. The meters span 0 to −48 LUFS.

LIMITER

The gain reduction of the final limiter, with an LED scale from 0 to 6 dB. **PEAK** is the deepest reduction of the last 3 seconds; the light reads ACTIVE while the limiter works. 1 to 3 dB is the normal range: the clipping stages, shown in MONITORING, do most of the work.

TRUE PEAK

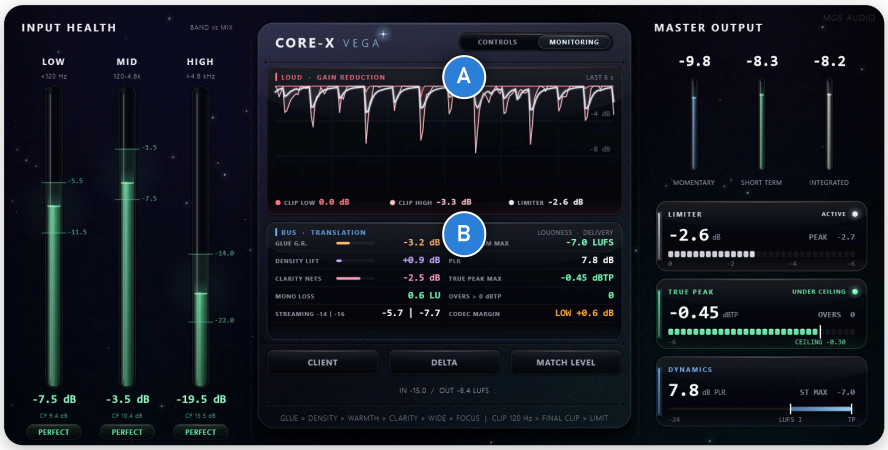
The highest true peak since the last reset, on a scale from −6 to +1 dBTP. The scale is marked at the ceiling, or at 0 dBTP in SAMPLE PEAK mode. The light is green under that limit and red above it. **OVERS** counts the peaks above 0 dBTP. In TRUE PEAK mode, the maximum sits about 0.15 dB under the ceiling: that is the limiter's safety reserve.

DYNAMICS

PLR, the peak-to-loudness ratio, is the distance between the true-peak maximum and the integrated loudness. The bar draws that span on a scale from −24 to 0 dB. A loud, dense master has a small PLR. **ST MAX** is the highest short-term loudness since the last reset.

Click the panel to reset maxima, overs and integrated loudness, for instance at the start of a new pass.

9 The MONITORING view



Click **MONITORING** at the top of the central panel to replace the settings with every measurement. CLIENT, DELTA and MATCH LEVEL stay available, so you can listen to DELTA while you watch the clipping.

A · LOUD gain reduction

The last 6 seconds of the LOUD section, one value per frame: the deepest reduction since the previous frame.

- **CLIP LOW**: the clipping of the band below 120 Hz.
- **CLIP HIGH**: the clipping of the band above 120 Hz and of the final soft clip.
- **LIMITER** (white line): the final limiter.

The values next to the legend, like the reductions in the details, have an instant attack, hold for 250 ms, then return at 12 dB per second; the readouts of different stages do not add up. The scale shows 6 dB, and 12 dB when the reduction goes deeper. Short, deep spikes on transients are expected from a clipper. A reduction that stays down between the hits means LOUD is high for this mix.

B · Details

Reading	Meaning
GLUE G.R.	Gain reduction of the glue compressor (GLUE).
DENSITY LIFT	How much the parallel density lifts the quiet parts (DENSE).
CLARITY NETS	The deepest cut of the three CLARITY safety nets.
MONO LOSS	The short-term loudness lost when the master is summed to mono: phone speaker, mono Bluetooth, club. Green up to 1 LU, orange up to 2 LU, red above. Wide commercial mixes typically lose 1 to 2 LU.
STREAMING −14 | −16	The gain the platforms will apply, from the integrated loudness: −14 LUFS for Spotify, YouTube, TIDAL and Amazon Music, −16 LUFS for Apple Music (Deezer: −15). Quieter masters are generally left as they are. Targets as of October 2026.
SHORT-TERM MAX	The highest short-term loudness since the last reset.
PLR	True-peak maximum minus integrated loudness.
TRUE PEAK MAX	The highest true peak since the last reset; red above the ceiling.
OVERS > 0 dBTP	The number of true-peak overs above 0 dBTP.
CODEC MARGIN	OK when the true-peak maximum is at or below −1 dBTP. Otherwise, LOW with the excess: lossy encoders (AAC, Opus, Vorbis) raise the peaks of a loud master.

10 Working with Core-X Vega

Mixing into it

Put Core-X Vega on the master bus early in the mix and leave it on, so your mix decisions are made through the final sound. Its thresholds follow the level of the song: moving your master fader does not change the processing, only how hard LOUD drives.

How loud?

There is no single right number. Streaming platforms turn loud masters down: a master at −8 LUFS integrated plays about 6 dB quieter on Spotify. Loudness is a stylistic choice: density, energy and the sound of the genre. It does not make a master louder on streaming. Use the STREAMING row to see the gain each platform applies, and MATCH LEVEL to judge the sound at equal loudness.

Ceiling and lossy codecs

Encoding to AAC, Opus, Vorbis or MP3 raises the peaks of a loud master. Spotify asks for true peaks under −1 dBTP, and under −2 dBTP for masters louder than −14 LUFS. In our tests, a −8 LUFS master with a −1 dB ceiling stayed under 0 dBTP after decoding with all four encoders. The default ceiling (−0.3 dB) suits lossless delivery; CODEC MARGIN then reads LOW. For streaming, set CEILING to −1.0 dB, or lower for very loud masters.

Delivering to a mastering engineer

Switch to **PRE-MASTER**. LOUD is bypassed, while the BUS sound you mixed through stays, with the same latency. Without the limiter, the ceiling does not apply: check TRUE PEAK MAX and leave the headroom your mastering engineer asks for.

Checking translation

- **Mono:** watch MONO LOSS. If it goes red, lower WIDE or check the stereo effects of the mix; FOCUS keeps the bass centred.
- **Small speakers:** FOCUS adds the harmonics a phone needs to play your sub at the right pitch.
- **Balance:** Input Health compares the mix to commercial releases.

Comparing honestly

Louder always sounds better at first. MATCH LEVEL removes that bias so you judge the processing itself. DELTA plays what LOUD removes: if it plays recognisable music rather than short ticks on the transients, LOUD is probably too high for this mix.

11 Specifications

Item	Value
Formats	Windows 10 and 11 (x64): VST3 plugin and standalone application; no AVX2 required. macOS 10.13 or later (Intel) and 11 or later (Apple Silicon): Audio Unit and VST3, universal binary.
Channels	Stereo in, stereo out.
Sample rates	44.1 to 192 kHz.
Latency	218 samples at 44.1 kHz (4.9 ms), 229 at 48 kHz (4.8 ms), 370 at 96 kHz (3.9 ms), 651 at 192 kHz (3.4 ms). Reported to the host, which compensates it.
CPU	About 9 to 10% of one core at 48 kHz with the default settings, 10 to 11% with every control at maximum (Windows, AMD Ryzen 7 3800XT, buffers of 64 to 1024 samples). About 14% at 96 kHz and 22% at 192 kHz.
Processing	Non-linear stages at 352.8 kHz or more; true-peak limiter with 3 ms look-ahead and an 8-phase detector.
Metering	ITU-R BS.1770 loudness (momentary, short-term, gated integrated), true peak, PLR, mono loss, streaming normalisation.
Saved with the session	All controls, the peak and output modes, and MATCH LEVEL. DELTA and the view (CONTROLS or MONITORING) are not saved.
Automation	All controls and both modes. The host sees 13 parameters, including two legacy ones (the old Limiter gain and Core Lift) kept so that Core-X Lite 1.x sessions load; they have no control on the interface.

12 Coming from Core-X Lite

Core-X Vega keeps the identifier and the parameter order of Core-X Lite: sessions made with any version of Core-X Lite reopen with Core-X Vega.

Sessions made with Core-X Lite 1.0 to 1.3

They reopen, but **they sound different**. The glue, the density, the clipping and the limiter are new. On reload:

- LOUD takes the total drive of the session (Clipper plus Limiter).
- The ceiling, Space (now WIDE) and Compress (now DENSE) keep their values.
- WARMTH reopens at 0% and CLARITY at 50%; FOCUS at 0%; GLUE at its default of 50%.
- Core Lift no longer has an effect.
- Automation of the old Clipper is read on the new LOUD range (−6 to +24 dB).

Sessions made with the 1.9 previews of Core-X Lite 2

They keep their settings. Version 2.0 sounds exactly like preview 1.9.6, sample for sample.

Keep the Core-X Lite 1.3 installer if you need the old sound for an older project.

13 Troubleshooting

Symptom	What to do
macOS blocks the installer	Expected: the installer is not signed by Apple. Allow it once in *System Settings › Privacy & Security › Open Anyway* (section 2).
The plugin does not appear	Check that the whole `Core-X Vega.vst3` folder is in your VST3 folder, that your host is 64-bit, then rescan.
Core-X Lite still appears, or the host reports a duplicate	Delete `Core-X Lite.vst3` from your VST3 folders and rescan.
The output goes above the ceiling	In SAMPLE PEAK mode, inter-sample peaks are not held: this is by design. A positive MATCH LEVEL trim, or another plugin after Core-X Vega, also lifts the output.
Input Health reads IDLE	The input is below −60 LUFS, or playback is stopped.
The integrated loudness looks wrong	It covers everything since the last reset: click the MASTER OUTPUT panel at the start of a pass.
The first half-second sounds different	At each start of playback, the glue and the density take about 0.4 s to measure the level of the song and settle.
High CPU	The load rises with the sample rate: about 9% of one core at 48 kHz, 22% at 192 kHz. Mix at 44.1 or 48 kHz if your computer struggles.

14 Version history and references

2.0.1, October 2026

- PUNCH is renamed GLUE, after what it does: it holds the mix together rather than pushing the kick and snare forward. The sound is unchanged, and sessions and automation are kept.
- The meter tubes are redrawn as liquid inside the glass.

2.0.0, October 2026: Core-X Vega

- New name and a redesigned interface: deep-space background, pearl faceplate, inflated-glass displays.
- MONITORING view, with the gain-reduction history of LOUD and every measurement.
- MASTER OUTPUT reduced to what you watch while mixing: LIMITER, TRUE PEAK and DYNAMICS.
- Input Health HIGH zone calibrated on the average spectrum of commercial releases.
- Available for macOS: Audio Unit and VST3, universal binary for Apple Silicon and Intel.
- The sound is identical to 1.9.6.

1.9 previews of Core-X Lite 2

- **1.9.6**: the true-peak ceiling is held at any loudness; relative Input Health; mono loss, codec margin and streaming readouts.
- **1.9.5**: WIDE redesigned on the side channel, with the mono sum untouched.
- **1.9.4**: WARMTH and CLARITY with their safety nets.
- **1.9.3**: FOCUS bass translation.
- **1.9.2**: the glue and the density no longer pump.
- **1.9.1**: FOCUS mono bass and the intermodulation guard of the bass clipper.
- **1.9.0**: the new engine: relative glue, parallel density, split clipping, new limiter.

References

- ITU-R BS.1770, *Algorithms to measure audio programme loudness and true-peak audio level*; EBU R 128.
- A. Elowsson and A. Friberg, *Long-term Average Spectrum in Popular Music and its Relation to the Level of the Percussion*, AES Convention 142, 2017.
- P. D. Pestana, Z. Ma, J. D. Reiss, A. Barbosa and D. A. Black, *Spectral Characteristics of Popular Commercial Recordings 1950–2010*, AES Convention 135, 2013.
- Spotify for Artists, *Loudness normalization on Spotify* (support.spotify.com), consulted October 2026.

Support and updates: **patreon.com/c/MG9Audio**

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