UNVEIL

# GOD MODE

Complete User Manual

Version 1.0.0
Mastering plug-in and standalone application for macOS
Audio Unit · VST3 · Standalone

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# 1. Welcome

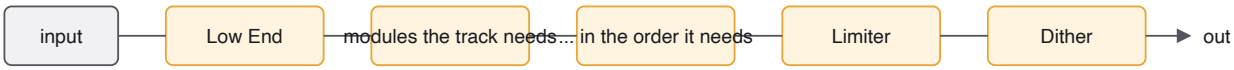
Unveil God Mode is a mastering tool that builds a different mastering chain for every track. It listens to the whole song, measures its spectrum, dynamics, stereo image, tempo and loudness, and then decides **which of twelve processors the track needs, in what order, and how every one of them should be set**. A bright, squashed, mono-heavy track and a dark, dynamic, wide one get chains that differ in the modules used, in their order and in essentially every setting. Mastering the same track twice gives exactly the same chain.

The chain always ends in a limiter built specifically for mastering: a soft limiter that rounds peaks off, feeding a brickwall limiter, with a guard that makes your true-peak ceiling the absolute maximum.

God Mode runs as an Audio Unit or VST3 plug-in in your DAW, and as a standalone application that masters audio files directly and exports the result.

### What is real

Every meter and display in God Mode is drawn from measurements of the audio that is actually passing through. When nothing is playing, the displays are empty. Nothing is animated for effect. Chapter 10 explains what each display is measuring.




Every module can be bypassed, soloed, trimmed (in / out) and routed stereo, mid/side or parallel.

# 2. Installing

### Requirements

- macOS 11 or later, on Apple silicon or Intel (the installer is universal).
- For the plug-in: a host that supports Audio Units or VST3 (stereo or mono tracks).

### Install

Open **Unveil God Mode 1.0.0.pkg** and follow the installer. It installs all three formats:

| Format | Location |
|---|---|
| Audio Unit | `/Library/Audio/Plug-Ins/Components/Unveil God Mode.component` |
| VST3 | `/Library/Audio/Plug-Ins/VST3/Unveil God Mode.vst3` |
| Standalone | `/Applications/Unveil God Mode.app` |

After installing, rescan plug-ins in your host if it does not list God Mode immediately. The Audio Unit is manufacturer `Unvl`, subtype `Ugdm`, type effect (`aufx`), and passes Apple's `auval` validation.

### Microphone permission

The standalone app can process an audio input. The first time it opens one, macOS asks whether God Mode may use the microphone; it is only used to master what you play into it.

### Uninstalling

Delete the three items listed above.

## 3. Quick start

### Standalone: master a file

1. Open **Unveil God Mode** from Applications.
2. Click **OPEN AUDIO FILE** and choose a track. WAV, AIFF, FLAC, Ogg Vorbis, MP3 and the formats macOS can decode (such as AAC and Apple Lossless) are accepted.
3. Watch the analysis: the real waveform of your file appears as it is read, then it is measured, the chain is built and its loudness tuned. This takes seconds, not minutes.
4. The file starts playing through the chain it built for it. Press the **space bar** to pause and resume.
5. Click **A** and **B** to compare the mastered and original sound. Leave **MATCH** on so they are equally loud.
6. Click **EXPORT**, choose the format, bit depth and sample rate, and click **RENDER MASTER**.

### Plug-in: master in your DAW

1. Put God Mode on the master bus, last in the chain.
2. Click **START LISTENING**.
3. Play the **whole song** from the start. God Mode listens to all of it.
4. When the music stops (silence for about 2.5 seconds after at least 3 seconds of music) the chain is built. You can also press **FINISH** at any time.
5. The chain it built is now running on your master bus. Adjust anything you like.

## 4. The interface

The window is a fixed 1240 × 780 pixel panel (236 pixels high in compact mode). It does not scroll or move inside its frame.




The header bar. Its buttons are described below.

### Header

| Control | What it does |
|---|---|
| PLAY / PAUSE | Standalone, when a file is loaded. Starts and pauses the file (also the space bar). Paused means silent: the live input is not passed through while a file is loaded. |
| FINISH | Plug-in, while listening. Stops listening and builds the chain from everything heard so far. |
| TARGET · LUFS · dBTP | The loudness and true-peak target. Click TARGET to choose a preset; drag LUFS or dBTP up and down to set your own. |
| IMPORT .FIX | Applies a `.Fix` file (chapter 12). It reads **.FIX LOADED** while one is active. |
| A · B · MATCH | A is the mastered sound, B the original. MATCH makes B as loud as A for a fair comparison. |
| STAGE · RACK · OVERLAY | Layouts: one module editor with the chain strip, every module at once, or every module drawn over one master spectrum. |
| COMPACT | Shrinks the window to the chain strip and meters. |
| EXPORT | Standalone: renders the mastered file. |
| STANDALONE · PLUG-IN | Show which mode the interface is in. |

### Chain strip

One tile per module, in processing order, left to right. Click a tile to edit that module; drag tiles to reorder; click the small light on a tile to bypass it; right-click for the module menu (chapter 8). A tile shows · *MID* or · *WET* when the module uses mid/side or parallel routing, and · *S* when it is soloed.

### Editor

The large area shows the selected module: its spectrum, its processing curve, and handles you can drag. Beside it are the module's **IN** and **OUT** level meters, which also carry the level trims.

### Master meters




The column on the right measures the signal leaving God Mode:

- **LUFS-S** bar: short-term loudness (3 second window).
- **TRUE PEAK** bars: left and right, with peak hold.
- **LUFS INTEGRATED**: gated loudness of everything since measuring started.
- **TP**: highest true peak. **LRA**: loudness range.
- **CORRELATION**: −1 (out of phase) to +1 (mono).
- The two white markers are your LUFS and true-peak targets; drag them to change the targets.

With nothing playing, the readouts show dashes, as in the picture.

## 5. How God Mode builds a chain

### What it measures

Over the whole song (every sample of a file, or everything you play while listening in a host):

- **Loudness:** integrated loudness and loudness range, to ITU-R BS.1770 and EBU Tech 3342.
- **Spectrum:** the long-term level of 31 third-octave bands from 20 Hz to 20 kHz, and how much each band varies over time.
- **Stereo image:** the side-to-mid level of every band, and the overall correlation.
- **Dynamics:** the crest factor (peak to RMS) and the distribution of peaks, in 0.4 second blocks.
- **Tempo:** found from how the music's onsets repeat, with a confidence figure.
- **Sibilance:** how far the 5–10 kHz region jumps out of its surroundings, and where.

### What it decides

| Module | How the measurements are used |
|---|---|
| Low End | High-pass just under the lowest meaningful content; Mono Below at the frequency where the side signal becomes significant; the bell on the strongest bass deviation. |
| Equalizer | Up to four bands placed on the strongest deviations of the spectrum from where it should sit, each with the frequency, depth and width the deviation has. If more remain, a second EQ is added near the end of the chain. |
| Dynamic EQ | Included only when some bands jump out intermittently; placed on those bands. |
| De-esser | Included only when sibilance stands out clearly; centred where it is. |

| | |
|---|---|
| Glue / Multiband | Amount from crest factor and loudness range; attack from onset sharpness; release from the tempo. Multiband is included when its bands behave differently, with crossovers where the track's energy divides. |
| Saturation | Included for clean, dynamic material that is not already loud; drive and tone follow how bright or dark it is. |
| Transient shaper | Included only for material that has lost its punch. |
| Stereo imager | Left out for near-mono material; otherwise widths follow how wide each region is, and very wide material is narrowed. |
| Tonal balance | Pulls the overall tilt toward a natural balance (or toward a reference). |
| Limiter | Release follows the tempo; look-ahead follows the crest factor; gain is tuned to the loudness target (below). |
| Dither | 24-bit by default; the noise type follows the loudness range. |

The **order** of the modules is decided too. Low End always comes first and Limiter and Dither last. In between, tonal problems are fixed before compression when they are large, and compression comes first when the tonal balance is already good; saturation, the transient shaper, the de-esser and the imager move earlier or later depending on the material.

### Tuned on your audio

Once the chain exists, God Mode runs it over excerpts of **your own track** (eight 5-second excerpts spread across a file, or the 40 seconds it kept while listening in a host) and adjusts the limiter's gain until the predicted loudness of the whole song lands on your target, within about 0.15 LU. A very quiet track may need more gain than the limiter's own control offers; the input trim adds the rest, to a total of 30 dB. A loud track is brought down the same way.

### Same track, same chain

The analysis is deterministic. The same audio always produces the identical chain, whatever the host's buffer size. A level change of even half a decibel moves the settings, because they are derived from the measurements, not picked from presets.

### Reference matching

Choose **TARGET → REFERENCE MATCH** and open a reference track. It is analysed the same way, the target loudness moves to its loudness, and the **whole chain is rebuilt** to bring your track toward its tone: EQ deviations are measured against the reference instead of against the track's own spectrum, and the tonal balance follows the reference's tilt. Loading a reference takes a moment, because the chain is rebuilt and its loudness re-tuned.

## 6. Working in the standalone app

### Loading a file

Click **OPEN AUDIO FILE**. Dropping a file onto the window also opens the file chooser (a web view cannot read a dropped file's location). The analysis runs in the background: the window stays responsive and

shows the real waveform of the file as it is decoded, the name of the stage (*DECODING*, *MEASURING LOUDNESS AND SPECTRUM*, *BUILDING THE CHAIN*, *TUNING THE LOUDNESS*) and the true progress. Loading another file cancels the one in progress.

The header shows the file's real name, sample rate, bit depth and length.

### Transport

The file plays through the chain and loops at the end. **PLAY / PAUSE** (or the space bar) uses a 10 millisecond fade so there are no clicks. While paused the output is silent and the position holds.

### A / B comparison

**A** is the mastered sound, **B** the original. The original is delayed by the chain's latency so the two line up in time. With **MATCH** on, B is brought to the same loudness as A (up to ±24 dB), so you judge tone and dynamics rather than volume.

### Exporting

1. Click **EXPORT**.
2. Choose the format (WAV, AIFF, FLAC or Ogg Vorbis), the bit depth (16, 24 or 32-bit float) and the sample rate (44.1, 48 or 96 kHz).
3. Click **RENDER MASTER**. The suggested name is the file's name followed by *_master*.

The render runs on its own thread and shows its real progress; audio output is paused while it runs. The chain's latency is trimmed from the start, so the exported file is exactly the length of the original and everything sits where it was. A format that does not support the chosen bit depth uses the nearest one it does. The **Dither / Output** module sets the noise added at the end of the chain; the export bit depth is the file's word length.

## 7. Working as a plug-in

### Listening

Click **START LISTENING**, then play the whole song from the start. God Mode measures everything that passes and shows the real level of what it hears and the time heard. It finishes by itself when at least 3 seconds of music have been heard and then 2.5 seconds of silence (below −60 dBFS) follow, which is the end of the song. If your song ends in a tail you want included, or does not end in silence, press **FINISH**.

If nothing was heard (the transport was stopped, or the track was silent), the source line reads **NO SIGNAL HEARD** and the previous analysis is kept. Play the music and re-analyse a module, or start again.

God Mode keeps listening after the chain is built, so re-analysing a module later uses everything heard since listening started.

### Latency

The limiter looks ahead, so the plug-in has latency: **720 samples at 48 kHz (15 ms)**. It reports this to the host, which compensates automatically. The latency does not change with any setting (if you remove the limiter from the chain it drops to zero).

### Automation and sessions

Every parameter of every module (including the second instance of each) is exposed to the host and can be automated; Appendix A lists the ids. Parameter values and the chain order are saved with the session.

### Buses and sample rates

Stereo and mono. Validated with Apple's `auval` from 11.025 kHz to 192 kHz.

## 8. Editing the chain

Everything God Mode sets can be changed. Right-click a module tile, or the editor, for the options below.

| Option | What it does |
|---|---|
| BYPASS | Takes the module out of the signal path. Its latency is kept, so nothing shifts. |
| SOLO | Hear only this module in the chain; the others are bypassed. Soloing one module clears any other solo. |
| ROUTE | Cycles **stereo** (the module processes left and right), **mid/side** (it processes the mid signal and passes the side through untouched) and **parallel** (the module's output is blended with the unprocessed signal; the Mix parameter sets the blend). |
| RE-ANALYZE | Re-runs the analysis for this module only, putting its settings back to the analysed values (the same item appears as RE-ANALYZE MODULE in a value menu). Bypass, solo, routing and level trims stay as you left them. |
| DUPLICATE | Adds a second instance of the module, with the same settings. Each module may appear twice. |
| REMOVE | Takes the module out of the chain (the chain keeps at least one module). |
| MOVE TO START | Moves the module to the start of the chain. |
| RESET ALL PARAMETERS | Sets every parameter of the module to its default (the tables in chapter 11) and clears its In and Out trims. |
| + MODULE | A button on the chain strip. Opens the list of modules; the one you pick is added after the selected module (a module can be added only if fewer than two of it are in the chain). |

### Editing a value

Drag a handle in the editor. Hold **Shift** for fine control. Scroll over a band's node to change its Q. The **IN** and **OUT** meters beside each module carry a ±12 dB trim; right-click one to set it exactly. Right-click a handle for a list of its values: drag a value up or down; double-click it to reset it to the module's default; **RESET** sets all of them to the defaults and **RE-ANALYZE MODULE** puts back what God Mode analysed.

### Reordering

Drag a tile to a new position. The order is what the audio really follows.

# 9. Loudness targets and the limiter

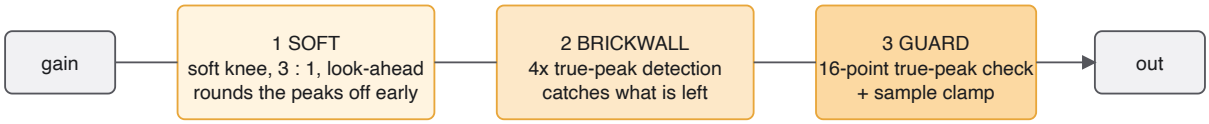
## Targets

The target is a loudness (–24 to –6 LUFS) and a true-peak ceiling (–3 to 0 dBTP). The presets:

| Preset | LUFS | dBTP |
|---|---|---|
| Streaming | –14.0 | –1.0 |
| Electronic | –8.5 | –0.3 |
| Hip-hop | –9.0 | –0.5 |
| Pop | –9.5 | –0.8 |
| Rock | –10.5 | –1.0 |
| Acoustic | –13.0 | –1.0 |
| Classical | –18.0 | –1.0 |
| Reference match | the loudness of the reference you load | |
| Custom | drag LUFS / dBTP, or the markers on the meter | |

Changing the target re-tunes the limiter's gain on the next analysis. The default is streaming: –14 LUFS and –1 dBTP.

## The limiter




The ceiling is the highest level that can leave the limiter, between the samples as well as on them.

The limiter is two limiters in series and a guard. All of its stages look ahead of the audio, so none of them ever needs to clip it.

1. **Soft stage.** Starts to act 1.5 dB under the ceiling with a gentle knee and a 3:1 ratio. Peaks up to about 4 dB over the ceiling are rounded off progressively and early, right up to the ceiling, instead of being cut. **Look-ahead** sets how far ahead it sees a peak coming; **Release** is a blend of a fast and a slow part, so short peaks recover quickly and sustained loudness recovers slowly.
2. **Brickwall stage.** A short look-ahead limiter with 4× oversampled true-peak detection. It only works on what the soft stage left over, such as a sudden spike or a very hot transient, and holds the signal to the ceiling.
3. **Guard.** One more true-peak stage on the final output, which reads the waveform between the samples at 16 points and aims 0.05 dB under the ceiling, followed by a hard clamp on the samples.

The gain around every peak is held perfectly flat across the width of the detector, so the correction cannot itself create a new overshoot between samples.

> **What the ceiling means.** The true-peak ceiling is the highest level that can leave the limiter. It was tested against hostile material (inter-sample peaks, square waves, single-sample spikes, very hot band-limited noise, 20 kHz bursts and sweeps) using a true-peak measurement independent of the plug-in, and never exceeded the ceiling. For energy within a few percent of the Nyquist frequency, "true peak" depends on the reconstruction filter assumed by the measuring device, so two meters may differ by a few hundredths of a dB there; the guard's 0.05 dB margin covers that.

## 10. Reading the displays

Every display is built from measurements streamed from the audio engine about 30 times a second: the level going into and out of each module in 5 millisecond steps, the spectrum of each module's output, and whatever each module reports about its own work. Nothing is generated.

| Display | What you are looking at |
|---|---|
| Spectrum (all modules) | Filled: the real spectrum leaving the module, in 96 logarithmic bands from 20 Hz to 20 kHz (each about 7 % wide), so a sine at −20 dBFS reads −20 and pink noise reads flat. Dashed line: the spectrum arriving from the module before it. Thin line: a slowly falling peak hold. |
| IN / OUT meters | The module's real input and output peak level, with a quick rise and a slow fall. |
| Dynamic EQ, Multiband, De-esser, Glue | The gain each band is really applying, or the gain reduction the compressor really has, in dB. |
| Glue gain-reduction history | The last five seconds of real gain reduction. |
| Transient shaper | The last two seconds of real input and output level as mirrored envelopes. |
| Stereo imager | The width you set, and the width each band really has (the side-to-mid level of the audio after the change). |
| Saturation | The module's actual transfer curve, and the harmonics that curve produces at the level that is really arriving. |
| Tonal balance | The track's own measured spectrum, your target corridor around it, and the live output on the same scale. |
| Limiter | The last three seconds of real signal: what leaves, and above it what the limiter took off; the readout is the real gain reduction. |
| Dither | The spectrum of the noise the module really adds (the difference between its output and input). |
| Master meters | Loudness, true peak, correlation and loudness range of the output. |
| Analysis picture | Standalone: the real waveform of the file as it is read, with the real stage name and progress. Plug-in: the real level of the music being heard. |

With nothing playing, these displays are empty or at zero. In **B** (original) mode the chain is not running, so its module displays stop updating.

# 11. Module reference

All ranges and defaults below are read from the plug-in's own parameter definitions. When God Mode builds a chain it replaces these defaults with values derived from your track.

Every module also has: **In** and **Out** level trims (–12 to +12 dB), **Bypass**, **Solo**, **Routing** (stereo, mid/side, parallel) and the parallel **Mix** (0–100 %).

### 1. Low End module id: lowend

Cleans and focuses the bottom of the mix. A steep high-pass removes subsonic energy, everything below the Mono Below frequency is summed to mono so the bass stays solid on any speaker, and one bell filter shapes the bass itself.

**What the display shows.** The spectrum behind the curve is the module's real output. The curve is the filter response the module is applying right now.

| Control | Range | Default | What it does |
|---|---|---|---|
| High-Pass | 20 to 120 Hz | 28 Hz | High-pass corner. A steep (24 dB per octave) filter. |
| Mono Below | 40 to 500 Hz | 120 Hz | Everything below this frequency is made mono. |
| Focus Freq | 30 to 250 Hz | 62 Hz | Centre of the low-end bell. |
| Focus Gain | -9 to 9 dB | 1.8 dB | Gain of the low-end bell. |
| Focus Q | 0.3 to 8 | 1.6 | Width of the low-end bell (higher = narrower). |

### 2. Equalizer module id: eq

Four independent bell filters. When God Mode builds a chain it places these bands on the track's own deviations: at the frequency where a resonance or a dip actually is, with a width (Q) that matches it. A track with no clear problem leaves the unused bands at 0 dB.

**What the display shows.** The filled spectrum is the module's real output; the dashed line is what the module before it delivers, so the difference is what the EQ did.

| Control | Range | Default | What it does |
|---|---|---|---|
| Freq 1 | 20 to 20000 Hz | 42 Hz | Centre frequency of band 1. |
| Gain 1 | -18 to 18 dB | -2.5 dB | Gain of band 1. |
| Q 1 | 0.3 to 8 | 1.2 | Width of band 1 (higher = narrower). |
| Freq 2 | 20 to 20000 Hz | 260 Hz | Centre frequency of band 2. |
| Gain 2 | -18 to 18 dB | -1.8 dB | Gain of band 2. |
| Q 2 | 0.3 to 8 | 1.4 | Width of band 2 (higher = narrower). |
| Freq 3 | 20 to 20000 Hz | 3200 Hz | Centre frequency of band 3. |

| | | | |
|---|---|---|---|
| Gain 3 | -18 to 18 dB | 1.6 dB | Gain of band 3. |
| Q 3 | 0.3 to 8 | 0.9 | Width of band 3 (higher = narrower). |
| Freq 4 | 20 to 20000 Hz | 11000 Hz | Centre frequency of band 4. |
| Gain 4 | -18 to 18 dB | 2.4 dB | Gain of band 4. |
| Q 4 | 0.3 to 8 | 0.7 | Width of band 4 (higher = narrower). |

### 3. Dynamic EQ module id: dyneq

Three bell filters whose gain follows the level in their own band. A band does nothing until the signal in it rises above the threshold, and reaches its full Range 12 dB above that. It is placed on frequencies that jump out only now and then, which a static EQ cannot fix without dulling the rest of the time.

**What the display shows.** The solid curve is the gain each band is applying at this moment, measured from the audio. The dashed curve is the full range that would be applied.

| Control | Range | Default | What it does |
|---|---|---|---|
| Freq 1 | 20 to 20000 Hz | 180 Hz | Centre frequency of band 1. |
| Range 1 | -18 to 18 dB | -4 dB | How far band 1 moves at full effect. Negative cuts, positive boosts. |
| Thresh 1 | -60 to 0 dB | -24 dB | Level in the band at which band 1 starts to act. It reaches its full range 12 dB above this. |
| Q 1 | 0.3 to 8 | 1.5 | Width of band 1. |
| Freq 2 | 20 to 20000 Hz | 2800 Hz | Centre frequency of band 2. |
| Range 2 | -18 to 18 dB | -3 dB | How far band 2 moves at full effect. Negative cuts, positive boosts. |
| Thresh 2 | -60 to 0 dB | -30 dB | Level in the band at which band 2 starts to act. It reaches its full range 12 dB above this. |
| Q 2 | 0.3 to 8 | 2 | Width of band 2. |
| Freq 3 | 20 to 20000 Hz | 7500 Hz | Centre frequency of band 3. |
| Range 3 | -18 to 18 dB | -5 dB | How far band 3 moves at full effect. Negative cuts, positive boosts. |
| Thresh 3 | -60 to 0 dB | -28 dB | Level in the band at which band 3 starts to act. It reaches its full range 12 dB above this. |
| Q 3 | 0.3 to 8 | 1.8 | Width of band 3. |

### 4. De-esser module id: deess

A single dynamic bell, centred between Band Low and Band High, that turns down harsh sibilance only while it is present. It is added to a chain only when the track's sibilance jumps out of its surroundings.

**What the display shows.** The reading under the curve is the gain reduction the module is really applying, in dB.

| Control | Range | Default | What it does |
|---|---|---|---|
| Band Low | 1000 to 20000 Hz | 5200 Hz | Lower edge of the band that is watched. |
| Band High | 1000 to 20000 Hz | 9800 Hz | Upper edge of the band that is watched. |
| Thresh | -48 to 0 dB | -30 dB | Level at which reduction starts. Full reduction is reached 12 dB above it. |
| Range | 0 to 18 dB | 6 dB | The most the de-esser will turn the band down. |

### 5. Glue Compressor module id: glue

A soft-knee compressor with a stereo-linked peak detector. The analysis sets the amount from the track's crest factor and loudness range, the attack from how sharp its onsets are, and the release from the tempo it detects, so the compressor lets go in time with the music.

**What the display shows.** The curve is the compressor's transfer curve; the dot on it is where the signal is right now. The shaded history on the right is the real gain reduction over the last five seconds.

| Control | Range | Default | What it does |
|---|---|---|---|
| Thresh | -48 to 0 dB | -18 dB | Level above which compression starts. |
| Ratio | 1 to 10 : 1 | 2 : 1 | Compression ratio. |
| Knee | 0 to 24 dB | 6 dB | Width of the soft knee. |
| Attack | 0.1 to 100 ms | 30 ms | How fast it clamps down. |
| Release | 50 to 2000 ms | 300 ms | How fast it lets go. |
| Makeup | 0 to 12 dB | 1.5 dB | Gain added after compression. |

### 6. Multiband Compressor module id: mb

Four bands separated by three Linkwitz-Riley crossovers that sum back flat. Each band has its own threshold and ratio. The analysis places the crossovers where this track's energy actually divides and sets each threshold from that band's own level.

**What the display shows.** Each band shows the gain reduction it is applying right now, measured from the audio.

| Control | Range | Default | What it does |
|---|---|---|---|
| Xover 1 | 30 to 16000 Hz | 120 Hz | Crossover 1. The three crossovers are always kept in order. |
| Xover 2 | 30 to 16000 Hz | 900 Hz | Crossover 2. The three crossovers are always kept in order. |
| Xover 3 | 30 to 16000 Hz | 5500 Hz | Crossover 3. The three crossovers are always kept in order. |
| Thresh 1 | -48 to 0 dB | -18 dB | Threshold of band 1. |
| Ratio 1 | 1 to 10 : 1 | 3 : 1 | Ratio of band 1. |

| | | | |
|---|---|---|---|
| Thresh 2 | -48 to 0 dB | -22 dB | Threshold of band 2. |
| Ratio 2 | 1 to 10 : 1 | 2.2 : 1 | Ratio of band 2. |
| Thresh 3 | -48 to 0 dB | -30 dB | Threshold of band 3. |
| Ratio 3 | 1 to 10 : 1 | 2 : 1 | Ratio of band 3. |
| Thresh 4 | -48 to 0 dB | -38 dB | Threshold of band 4. |
| Ratio 4 | 1 to 10 : 1 | 2.5 : 1 | Ratio of band 4. |

### 7. Saturation module id: sat

A soft waveshaper that adds harmonics and rounds peaks without changing the level of quiet material (its gain is 1 for small signals). Drive pushes the signal harder into the curve, Character adds even harmonics, Tone tilts the result brighter or darker, and Blend mixes it with the original.

**What the display shows.** The curve is the real transfer curve of the module. The bars are the harmonics that curve produces at the level that is really arriving, worked out from the module's own formula.

| Control | Range | Default | What it does |
|---|---|---|---|
| Drive | 0 to 100 % | 35 % | How hard the signal is pushed into the curve. |
| Character | 0 to 100 % | 40 % | Balance of odd (0) and even (100) harmonics. |
| Tone | -100 to 100 % | 10 % | Tilt of the saturated signal, about 800 Hz: negative is darker, positive brighter (up to ±4 dB). |
| Blend | 0 to 100 % | 100 % | Blend between the original (0) and the saturated signal (100). |

### 8. Transient Shaper module id: trans

Raises or lowers the attack and the sustain of the music by following its envelope. Sensitivity sets how readily it reacts. It is used on material that has lost its punch.

**What the display shows.** The grey shape is the level going in over the last two seconds; the coloured shape is the level coming out. Both are measured.

| Control | Range | Default | What it does |
|---|---|---|---|
| Attack | -100 to 100 % | 35 % | Boost (positive) or softening (negative) of the attack. |
| Sustain | -100 to 100 % | -15 % | Boost or reduction of the sustain. |
| Sensitivity | 0 to 100 % | 60 % | How readily the shaper reacts to level changes. |

### 9. Stereo Imager module id: imager

Four bands, each with its own stereo width. 0 % is mono, 100 % leaves the width alone and 200 % doubles the side signal. The analysis sets the crossovers and widths from how wide each region of the track already is, and narrows material that is already very wide.

**What the display shows.** The light block is the width you have set; the bright block is the width that band really has right now, measured from the side-to-mid level of the audio.

| Control | Range | Default | What it does |
|---|---|---|---|
| Xover 1 | 30 to 16000 Hz | 150 Hz | Crossover 1. |
| Xover 2 | 30 to 16000 Hz | 1200 Hz | Crossover 2. |
| Xover 3 | 30 to 16000 Hz | 6000 Hz | Crossover 3. |
| Width 1 | 0 to 200 % | 0 % | Stereo width of band 1 (0 % mono, 100 % unchanged, 200 % double). |
| Width 2 | 0 to 200 % | 90 % | Stereo width of band 2 (0 % mono, 100 % unchanged, 200 % double). |
| Width 3 | 0 to 200 % | 120 % | Stereo width of band 3 (0 % mono, 100 % unchanged, 200 % double). |
| Width 4 | 0 to 200 % | 150 % | Stereo width of band 4 (0 % mono, 100 % unchanged, 200 % double). |

### 10. Tonal Balance module id: tonal

A gentle tilt of the whole sound toward a target. A low shelf (around 200 Hz) and a high shelf (around 5 kHz) are driven toward the Low and High targets. If a section of the music drifts away from the track's own long-term balance by more than the Tolerance, the excess is corrected, so the tone stays consistent from start to finish.

**What the display shows.** The dashed line is the track's own long-term spectrum as measured by the analysis; the shaded corridor is your target; the bright line is the live output on the same scale.

| Control | Range | Default | What it does |
|---|---|---|---|
| Low Target | -12 to 12 dB | 1 dB | Target for the low end, in dB. |
| High Target | -12 to 12 dB | -0.5 dB | Target for the high end, in dB. |
| Tolerance | 1 to 8 dB | 3 dB | How far the balance may drift from the track's long-term balance before it is pulled back. |
| Match | 0 to 100 % | 70 % | How much of the correction is applied. |

### 11. Limiter module id: limiter

Two limiters in series with a guard, so the ceiling is the absolute true-peak maximum. See chapter 9 for how it works.

**What the display shows.** Each column is a few tens of milliseconds of the real signal. The dark bar is what leaves the limiter; the light part above it is what the limiter took off. The readout is the real gain reduction of the soft and brickwall stages together.

| Control | Range | Default | What it does |
|---|---|---|---|
| Gain | 0 to 18 dB | 6.5 dB | Gain into the limiter. This is what makes the track louder. The analysis tunes it so the result lands on the loudness target. |
| Ceiling | -3 to 0 dB | -1 dB | The true-peak ceiling. Nothing leaves the limiter above this. |
| Release | 1 to 1000 ms | 120 ms | Release of the soft stage (the brickwall stage's release follows it). |
| Lookahead | 0.1 to 10 ms | 3 ms | Look-ahead of the soft stage: how far ahead it sees a peak coming. |

### 12. Dither / Output module id: dither

Word-length reduction at the end of the chain. TPDF dither decorrelates the rounding error; the shaped and high-order modes push the noise toward high frequencies where it is least audible. Trim sets the final level.

**What the display shows.** The curve is the spectrum of the noise this module really adds, measured as the difference between its output and its input. The dashed lines show where 16-, 20- and 24-bit noise floors sit.

| Control | Range | Default | What it does |
|---|---|---|---|
| Bit Depth | 16 · 20 · 24 | 24 | Target word length. |
| Noise | TPDF · SHAPED · HI-ORDER | SHAPED | Noise type. |
| Shaping | 0 to 100 % | 40 % | How much the noise is pushed toward high frequencies. |
| Trim | -6 to 6 dB | 0 dB | Output level. |

# 12. .Fix files

A `.Fix` file carries corrections made elsewhere (for example by the Unveilmusic.app analyzer). It is UTF-8 JSON. Import one with **IMPORT .FIX**.

### Corrections stack on the analysis

God Mode analyses your track first. A correction is then **combined** with the value the analysis chose; it does not replace it.

| Parameter type | Rule | Example |
|---|---|---|
| Gains, thresholds, ranges, widths, trims (dB or %) | **Added** to the analysed value. | Analysed EQ band 2 gain –2.0 dB, fix –3.4 → –5.4 dB. |
| Frequencies, times, Q, ratios | **Scaled** by the fix value ÷ the module's default. | EQ band 2 default is 260 Hz; a fix of 520 Hz doubles the analysed frequency. |
| Bypass, solo, routing, dither mode, limiter ceiling | **Replace** the analysed value. | Ceiling –2 → –2. |

- A fix stacks on the analysis, never on another fix: importing the same file twice gives the same result, and importing a second fix undoes the first one's changes.
- Two corrections to one parameter in the same file accumulate.
- The result is limited to the parameter's range.
- A fix belongs to the track it was made for: loading a new track removes it. It is kept if the same track is re-analysed (a reference is loaded, a module is re-analysed or the target changes).
- If the fix carries a new target loudness, the analysis and loudness tuning are redone first and the corrections go on top.
- If nothing has been analysed yet there is nothing to stack on, so a correction simply sets the value.

### Format

```
{ "version": 1, "source": "unveilmusic.app",
  "target":  { "lufs": -14, "truePeak": -1 },
  "chain":   ["lowend", "eq", "glue", "limiter", "dither"],
  "corrections": [
    { "module": "eq",    "param": "g2", "value": -3.4, "reason": "low-mid build-up" },
    { "module": "eq",    "param": "f2", "value": 310 },
    { "module": "deess", "param": "th", "value": -34 } ] }
```

| Field | Meaning |
|---|---|
| `version` | Must be 1. Required. |
| `corrections` | Required. A list of `module` (a module id; a second instance ends in `2`), `param` (a key from the module's table, or `in`, `out`, `byp`, `solo`, `route`, `pmix`) and `value`. `reason` is an optional note. Unknown module/parameter pairs are skipped. |

| | |
|---|---|
| `target` | Optional: `lufs` (–24 to –6) and `truePeak` (–3 to 0). Leaving one out keeps the current target. |
| `chain` | Optional: the chain order. Modules not listed are removed. |
| `track`, `source` | Informational only. |

A file with no `corrections` list applies nothing. The full schema is `fix.schema.json` in the project.

# 13. Technical notes

| Item | Value |
|---|---|
| Formats | Audio Unit (effect), VST3, Standalone; macOS 11+, universal (arm64 and x86_64) |
| Channel layouts | Mono and stereo |
| Sample rates | Any; validated 11.025 kHz to 192 kHz |
| Latency | 720 samples at 48 kHz (about 15 ms) while the limiter is in the chain; constant for every setting and reported to the host |
| CPU | The limiter about 3.5 % and the default twelve-module chain about 5 % of one core at 48 kHz (measured on an Apple-silicon Mac) |
| Loudness measurement | ITU-R BS.1770 K-weighted, 400 ms blocks every 100 ms, absolute gate –70 LUFS and relative gate –10 LU; loudness range per EBU Tech 3342 |
| True peak | 4× oversampled in the meter and the brickwall stage; 16-point windowed-sinc in the guard |
| Analysis resolution | 16 384-point FFT with 50 % overlap, 31 third-octave bands |
| Modules | 12 types, up to two of each (24 slots), 300 automatable parameters |
| Interface | Embedded web view (WKWebView); the interface works without a network connection |

### Not included in this version

- Windows and Linux builds, and AAX.
- Dropping a file on the standalone window opens the file chooser rather than loading the dropped file directly.
- Audio is paused while a file is being exported.

# 14. Troubleshooting

| Problem | What to try |
|---|---|
| The plug-in is not listed in my host | Rescan plug-ins in the host and restart it. Check that the files in chapter 2 exist. For the Audio Unit, `auval -v aufx Ugdm Unvl` in Terminal should end with "AU VALIDATION SUCCEEDED". |

| | |
|---|---|
| "NO SIGNAL HEARD" | Nothing was playing while God Mode listened. Start the host's transport, play the music and start again, or re-analyse a module while the music plays. |
| Listening never finishes | The song does not end in silence, or there is background noise. Press **FINISH**. |
| The meters show dashes and the displays are empty | Nothing is passing through. In the standalone app, check that a file is loaded and playing, or the input device is working. |
| Standalone is silent | A loaded file is paused (press the space bar), or the audio output device is not selected in the app's settings. |
| The loudness is not at my target | Check that you are listening to **A** and that other plug-ins after God Mode are not changing the level. The target is the loudness of the whole song; a short section can be louder or quieter. |
| B sounds louder or quieter than A | Turn **MATCH** on. |
| Two tracks got different chains | That is by design: the chain is built from each track's own measurements. |
| An exported file sounds the same as the original | Check that you were on **A** and that the chain contains modules; the file is rendered from the chain, not from the A/B switch. |
| The first load of a very long file takes a while | The whole file is decoded and measured; the window shows the real progress. |

## 15. Glossary

| Term | Meaning |
|---|---|
| LUFS | Loudness units relative to full scale: loudness as the ear perceives it, measured with a K-weighting filter. |
| LU | A difference of one loudness unit, equal to 1 dB. |
| LRA | Loudness range: the spread between the quiet and loud parts of a song, from the 10th to the 95th percentile of its 3-second loudness. |
| True peak (dBTP) | The highest level of the waveform including the values between samples, which a converter will reproduce. |
| Crest factor | The difference in dB between a signal's peak and its average (RMS) level. Squashed music has a low crest factor. |
| Look-ahead | A limiter or compressor that delays the audio slightly so it can see a peak before it arrives. |
| Mid / side | The sum of left and right (what is in the centre) and their difference (what makes the sound wide). |
| Correlation | How alike left and right are: +1 mono, 0 unrelated, –1 opposite in phase. |
| Dither | Low-level noise added before reducing the word length, so the rounding error does not become distortion. |
| Latency | The delay a plug-in adds. The host compensates for it so tracks stay aligned. |

# Appendix A: parameter ids

These are the ids used for host automation and in `.Fix` files. A parameter is `<module>_<key>`; a second instance is `<module>2_<key>`. Every module also has `in`, `out`, `byp`, `solo`, `route` and `pmix`. The global parameters are `global_lufs` (target loudness), `global_tp` (target true peak), `global_ab` (0 = A, 1 = B) and `global_match` (loudness match).

| Module | Parameter ids (second instance: `{module}2_{key}`) |
|---|---|
| Low End | `lowend_hp`, `lowend_mono`, `lowend_bf`, `lowend_bg`, `lowend_bq` |
| Equalizer | `eq_f1`, `eq_g1`, `eq_q1`, `eq_f2`, `eq_g2`, `eq_q2`, `eq_f3`, `eq_g3`, `eq_q3`, `eq_f4`, `eq_g4`, `eq_q4` |
| Dynamic Eq | `dyneq_f1`, `dyneq_r1`, `dyneq_t1`, `dyneq_q1`, `dyneq_f2`, `dyneq_r2`, `dyneq_t2`, `dyneq_q2`, `dyneq_f3`, `dyneq_r3`, `dyneq_t3`, `dyneq_q3` |
| De-Esser | `deess_f1`, `deess_f2`, `deess_th`, `deess_rng` |
| Glue Compressor | `glue_th`, `glue_ra`, `glue_kn`, `glue_at`, `glue_re`, `glue_mk` |
| Multiband Compressor | `mb_x1`, `mb_x2`, `mb_x3`, `mb_t1`, `mb_r1`, `mb_t2`, `mb_r2`, `mb_t3`, `mb_r3`, `mb_t4`, `mb_r4` |
| Saturation | `sat_dr`, `sat_ch`, `sat_tone`, `sat_mix` |
| Transient Shaper | `trans_at`, `trans_su`, `trans_sens` |
| Stereo Imager | `imager_x1`, `imager_x2`, `imager_x3`, `imager_w1`, `imager_w2`, `imager_w3`, `imager_w4` |
| Tonal Balance | `tonal_lo`, `tonal_hi`, `tonal_wd`, `tonal_amt` |
| Limiter | `limiter_gain`, `limiter_ceil`, `limiter_rel`, `limiter_la` |
| Dither / Output | `dither_bits`, `dither_type`, `dither_shp`, `dither_trim` |

# Appendix B: mouse and keyboard

| Action | Effect |
|---|---|
| Space bar | Standalone: play / pause. |
| Click a module tile | Edit that module. |
| Drag a module tile | Reorder the chain. |
| Click the light on a tile | Bypass the module. |
| Right-click a tile, handle or meter | Open its menu of options and values. |
| Drag a handle | Change its value. |
| Shift + drag | Fine adjustment. |
| Scroll over a band node | Change that band's Q. |

| | |
|---|---|
| Double-click a value in a menu | Reset it to the module's default. |
| Drag the target markers on the meter | Change the LUFS and true-peak targets. |