

4K EQ 2

Calibrated British console EQ with Brown and Black voicings

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Overview

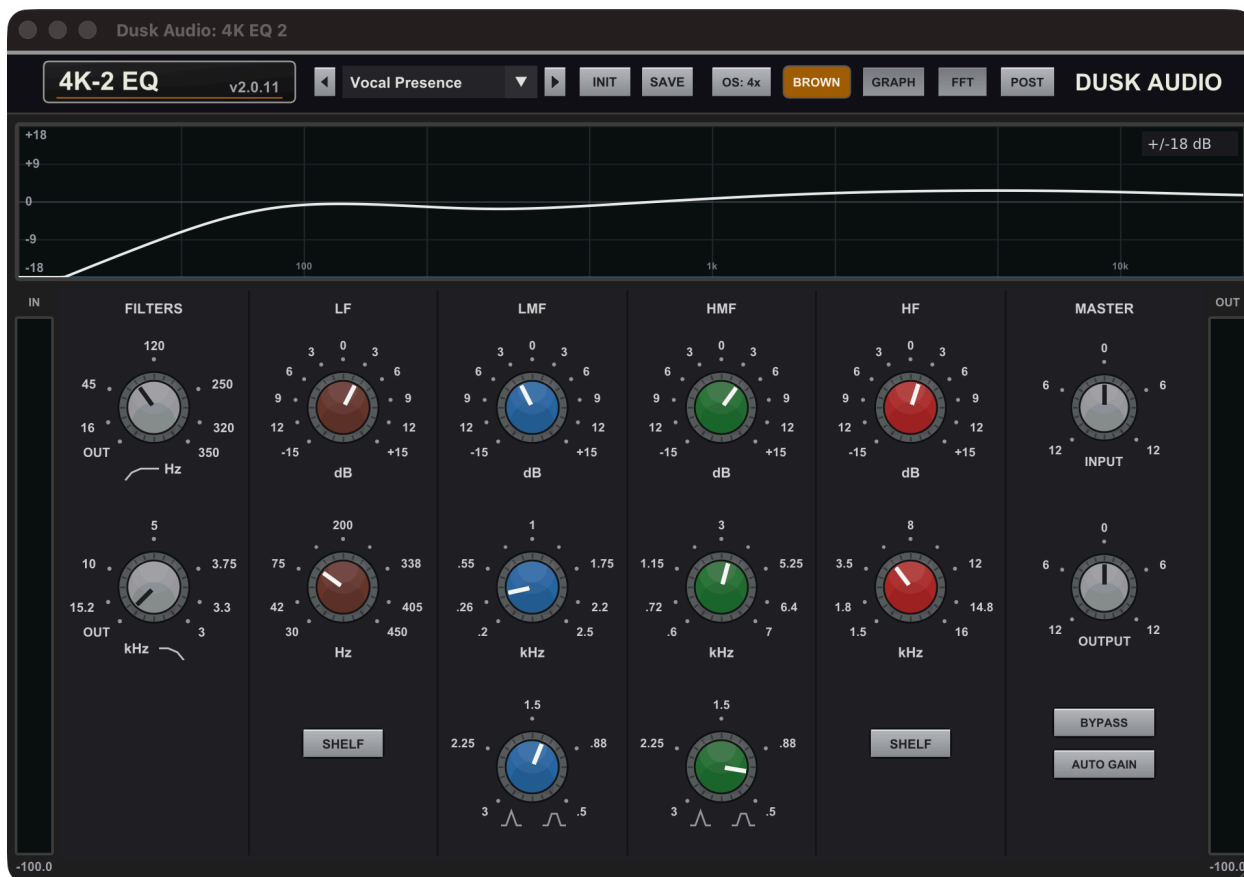


Figure 1: 4K EQ 2 with Vocal Presence loaded

4K EQ 2 models the equalizer and high-pass/low-pass filters of a classic British E-series channel strip. The Brown and Black modes are separate voicings, not cosmetic themes. Each mode uses its own measured frequency, gain, Q, shelf, filter, interaction, nonlinearity, and overload behavior.

Use it for broad tonal decisions where a console EQ is faster than a surgical parametric equalizer: shaping drums, moving a vocal forward, removing low-end clutter, or adding a restrained shelf to a mix bus. The LMF and HMF sections remain fully adjustable when a narrower correction is needed, but this is not a dynamic EQ or a linear-phase mastering tool.

The modeled EQ path has a fixed amount of native nonlinear color. There is no Drive control. Raise Input when you want to hit the modeled path harder, then trim Output for a fair comparison. The preamp and dynamics portions of the original channel strip are intentionally outside this plugin.

Quick Start

1. Insert 4K EQ 2 and click **INIT**. Leave Input and Output at 0 dB, Auto Gain off, and the filters at OUT while you learn the bands.
2. Start in **Brown** mode. Raise one gain control to about +6 dB, sweep its frequency until the target becomes obvious, then reduce the gain to the amount the mix needs.
3. Use **LMF Q** or **HMF Q** to set bandwidth. Lower values make a wider move; higher values focus the boost or cut.
4. Use the LF or HF button to switch that band between **SHELF** and **BELL**.
5. Turn the HPF away from OUT to remove low-frequency buildup. Turn the LPF away from OUT only when the source needs deliberate top-end restriction.
6. Switch to **Black** and compare at the same settings. Black uses a different control law and proportional-Q mid bands, so it can feel tighter as the gain move grows.
7. If you raise Input for more nonlinear character, lower Output by roughly the same amount. Enable Auto Gain only as a convenience while auditioning.

The printed frequency marks reproduce the console dial. The value bubble shown while you hover or drag reports the calibrated audible frequency, which is the number to use when matching a target or typing a value.

Workflows

Vocal presence without losing body

Source: Lead vocal peaking around -10 dBFS with low-frequency proximity build-up. **Target:** Reduce rumble and boxiness while moving consonants forward.

- Brown mode
- HPF at 80 Hz
- LF +3 dB at 100 Hz, shelf
- LMF -3 dB at 300 Hz, Q 1.3
- HMF +4 dB at 3.5 kHz, Q 0.7
- HF +2 dB at 8 kHz, shelf
- Input and Output at 0 dB; Auto Gain off

This is the **Vocal Presence** factory preset. The HPF clears material below the useful vocal range, the LMF cut reduces boxiness, and the wide HMF/HF boosts add intelligibility and air. If the result is sharp, lower the HMF gain first rather than moving every frequency.

Kick with weight and beater definition

Source: Close kick microphone with useful sub energy but too much 200 Hz body. **Target:** Add low-end weight and a readable attack in a dense mix.

- Brown mode
- HPF at 30 Hz
- LF +4 dB at 50 Hz, shelf
- LMF -2.5 dB at 200 Hz, Q 0.8

- HMF +3 dB at 2 kHz, Q 1.5
- HF flat
- Input +2 dB and Output -2 dB if additional path color is wanted

The broad LF move supplies weight, the LMF cut makes room above it, and the narrower HMF boost adds beater definition. Start from **Kick Punch** and move the LF frequency toward 70 or 80 Hz when the drum's fundamental sits higher.

Black-mode drum bus shaping

Source: Stereo drum bus with enough level but soft low-end impact and a cloudy low-mid range.

Target: Tighter punch with a modest top lift.

- Black mode
- Filters at OUT
- LF +4 dB at 70 Hz, shelf
- LMF -3 dB at 350 Hz, Q 0.6
- HMF +3 dB at 3.5 kHz, Q 1.0
- HF +2.5 dB at 10 kHz, shelf
- Input 0 dB; Output 0 dB; Auto Gain off

This is **Drum Bus Punch**, the factory bank's Black-mode preset. Black's proportional-Q mid behavior keeps larger moves more focused. If cymbals become forward, reduce the HF gain before changing the HMF presence move.

Acoustic guitar cleanup and detail

Source: Close-miked steel-string guitar with low-body buildup and muted pick detail. **Target:** Clear space below the instrument and recover articulation.

- Brown mode
- HPF at 80 Hz
- LF -2 dB at 100 Hz, shelf
- LMF +2 dB at 200 Hz, Q 0.7
- HMF +3 dB at 2.5 kHz, Q 0.9
- HF +4 dB at 12 kHz, shelf

Load **Acoustic Guitar** as the starting point. If the guitar is already thin, return LF to 0 dB before reducing the HPF. If finger noise dominates, lower the HMF move while keeping the HF shelf for openness.

Restrained mix-bus sweetening

Source: Balanced mix with headroom and no major corrective problem. **Target:** Small tonal moves that remain useful after level matching.

- Brown mode
- Filters at OUT
- LF +1 dB at 50 Hz, shelf
- LMF -1 dB at 600 Hz, Q 0.5
- HMF +0.5 dB at 4 kHz, Q 0.6
- HF +1.5 dB at 15 kHz, shelf
- Output -0.5 dB

- Input 0 dB; Auto Gain off

This is **Master Bus Sweetening**. Compare with Bypass at the same perceived level. On a finished mix, a 0.5 dB change is meaningful; avoid compensating for an unsuitable curve by driving the modeled path harder.

Parameter Reference

Header and presets

- **Preset browser:** Recalls 14 factory programs and saved user presets. Factory recall owns the sound-shaping parameters but leaves oversampling and analyzer preferences alone. A common mistake is expecting a recalled preset to restore the previous oversampling choice.
- **INIT:** Restores all preset-owned parameters to their defaults. It does not alter Bypass, oversampling, or analyzer state. Use it for a flat starting point.
- **SAVE:** Writes the current sound-shaping state to the user preset library. On macOS and Linux, presets live under `~/.config/DuskAudio/FourKEQ2/presets`; Windows uses the application-data directory. Invalid or unsupported preset files are ignored by the browser.
- **OS:** Cycles 1x, 2x, and 4x; default 4x. Higher factors reduce aliasing from the nonlinear path but use more CPU and add latency. At 88.2 or 96 kHz the effective maximum is 2x; at 176.4 or 192 kHz it is 1x.
- **BROWN / BLACK:** Selects the complete console voicing; default Brown. Brown uses constant-Q mid bands. Black applies proportional Q as boost or cut grows.
- **GRAPH:** Shows or collapses the response graph. The graph range menu offers +/-6, +/-12, +/-18, +/-30 dB, and a warped view.
- **FFT:** Enables or disables the live spectrum trace. Disable it when you want the lowest possible UI overhead.
- **PRE / POST:** Selects the analyzer tap before or after the EQ. It changes only the display, not the audio path.

Filters

- **HPF:** OUT by default, then 16 to 350 Hz. Moving away from OUT enables the filter. Brown and Black use different measured responses. Use it to remove rumble; the common mistake is setting it from the printed dial alone without listening to the source's fundamental.
- **LPF:** OUT by default, then 15.201 down to 3 kHz. Use it for deliberate bandwidth restriction or high-frequency cleanup. The control runs downward in frequency as it turns clockwise, matching the panel layout.

EQ bands

- **LF Gain:** -15 to +15 dB, default 0 dB. **LF Frequency:** 30 to 450 Hz, default 200 Hz. **SHELF/BELL:** shelf by default. Use the shelf for broad weight and the bell for a localized low-frequency move.
- **LMF Gain:** -15 to +15 dB, default 0 dB. **LMF Frequency:** 200 Hz to 2.5 kHz, default 1 kHz. **LMF Q:** 0.5 to 3.0, default 1.5. Use lower Q for broad body changes and higher Q for a focused low-mid correction.
- **HMF Gain:** -15 to +15 dB, default 0 dB. **HMF Frequency:** 600 Hz to 7 kHz, default 3 kHz. **HMF Q:** 0.5 to 3.0, default 1.5. Use it for presence, attack, or upper-mid harshness.

- **HF Gain:** -15 to +15 dB, default 0 dB. **HF Frequency:** 1.5 to 16 kHz, default 8 kHz. **SHELF/BELL:** shelf by default. Use the shelf for air and the bell when the desired change is centered below the extreme top end.

At exactly 0 dB, each EQ section bypasses its recursive filter state. This keeps the neutral path free of the subsonic numerical residue that can result from running nominally unity biquads.

Master and metering

- **Input:** -12 to +12 dB, default 0 dB. It sets the level entering the modeled EQ path and therefore the nonlinear behavior. Do not treat it as an output loudness control.
- **Output:** -12 to +12 dB, default 0 dB. Use it to restore level after Input changes or deliberate EQ boosts.
- **Bypass:** Off by default. It uses a short smoothing transition to avoid a click. Compare at matched level.
- **Auto Gain:** Off by default. It estimates compensation from the active EQ curve. It is useful while exploring, but a spectrum-based estimate cannot guarantee equal perceived loudness for every source.
- **IN / OUT meters:** Peak meters at the panel edges. The numeric hold refreshes more slowly than the bars so short peaks remain readable.

Tips and Traps

- Brown and Black can produce different audible frequencies at the same printed dial position. Use the live value bubble when matching a known frequency.
- Frequency automation retains the calibrated host-control coordinates used by earlier 2.x sessions. The UI translates them to audible frequency for display.
- A large EQ boost can hit the modeled rail even when the DAW input meter looks safe. Lower Input or the band gain if the overload is not intentional.
- Auto Gain is a convenience, not part of the modeled channel-strip signal path. Factory presets turn it off so their level and curve recall deterministically.
- Oversampling changes reported latency. Avoid changing it while recording or while a host is not prepared to refresh plugin delay compensation.
- The old Drive and M/S parameter indices may still appear in generic host views for compatibility. They are hidden or inert and are not part of the UI.

Presets Explained

- **Vocal Presence:** Brown vocal cleanup and forward presence. Adjust the HPF first for the singer, then the 3.5 kHz HMF gain.
- **Kick Punch:** Low shelf, low-mid cut, and 2 kHz attack. Move LF frequency to the drum's fundamental.
- **Snare Crack:** 250 Hz body, 5 kHz crack, and an 8 kHz HF bell. Lower HMF if the snare becomes brittle.
- **Drum Bus Punch:** The single Black factory preset, with tighter low-mid and presence shaping. Reduce HF first on cymbal-heavy buses.
- **Bass Warmth:** 80 Hz weight with a 400 Hz cut and 10 kHz LPF. Move the LPF out for bright bass parts.
- **Bass Guitar Polish:** 60 Hz weight, 250 Hz cleanup, and upper-mid definition. Adjust HMF for finger or pick noise.

- **Acoustic Guitar:** HPF cleanup plus 2.5 kHz detail and a 12 kHz shelf. Return LF to flat on thin recordings.
- **Piano Brilliance:** Low foundation, 500 Hz cleanup, and two presence lifts. Reduce HF on close, bright piano recordings.
- **Bright Mix:** 60 Hz and 10 kHz shelves around a 2.5 kHz dip. Keep each move small on a finished mix.
- **Glue Bus:** A broader mix-bus contour centered on 100 Hz, 3 kHz, and 10 kHz. Use Output for level matching.
- **Telephone EQ:** 300 Hz HPF, 3 kHz LPF, and 1 kHz LMF boost. Adjust the LMF gain to control how nasal the result becomes.
- **Air & Silk:** HMF at 7 kHz plus a 15 kHz shelf. Lower HMF before HF when sibilance rises.
- **Master Sheen:** Small 5 kHz and 16 kHz lifts. Start here when the mix needs only top-end polish.
- **Master Bus Sweetening:** Four sub-1.5 dB mastering moves with -0.5 dB output. Bypass frequently and keep the change only if it survives level matching.

Troubleshooting

The EQ appears to do nothing. Confirm Bypass is off and at least one band gain is away from 0 dB, or an HPF/LPF knob is not OUT. The HPF and LPF remain bypassed only while their knobs read OUT.

The frequency bubble does not match the printed legend. The legend is the console's control marking; the bubble is the measured audible frequency. Use the bubble or typed entry when an exact target matters.

The plugin becomes louder or distorts after an Input change. Lower Output by the same amount for comparison. If it still overloads, lower Input or the largest EQ boost. Auto Gain compensates the curve estimate, not every nonlinear level change.

A saved preset is missing from the browser. Check that the preset directory is writable. Files with malformed numeric fields, unsupported format versions, or unsupported frequency domains are rejected rather than partially loaded.