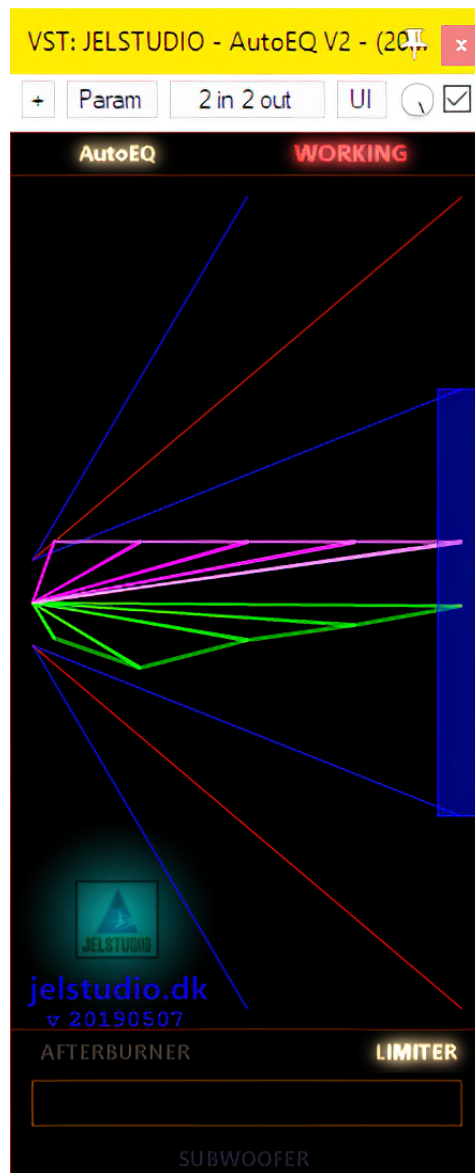# JELSTUDIO's "Auto EQ", version 20190507

A dynamic automatic tonal equalizer plugin for LIVE or mixing/mastering use.

AutoEQ's purpose is to automatically and continuously adjust the EQ-curve to obtain a generally all-round pleasing tonality.

Technically it is a 32/64 bit VST2 audio-effect plugin mainly for DAWs and sound/video-editors on Windows, but it can also be used in a LIVE VST-host (for example with LIVE stage-performance audio, or with music/TV home-stereo audio)

AutoEQ is optimized for music (both songs and individual instruments) but often works equally well with spoken content (such as television and movies)

Some of AutoEQ's key-points:

- Built-in safety brickwall-limiter on output (can be disabled)
- Zero latency (for LIVE use or for tracking)
- Built-in gain-staging control (defaults to -24 dB FS)
- GUI layout is optimized for 'peripheral vision overview' (when looking at the center of the GUI; all important displays can be read at a glance with peripheral vision)
- For Windows 7, 8, 10
- Zip with .dll (no .exe installation)
- No DRM (Such as PhoneHome, iLok, etc)

Order of AutoEQ's internal audio-routing:

Mono/Stereo input → Gain Stage → EQ Filter → EQ Gain Algorithm → Gain Match Algorithm → Safety Limiter → Output

Usage (how to operate):

TL;DR
(Minimum required reading)

#1: Add AutoEQ to your plugin-chain.

#2: Start your sound playing.

#3: Adjust input gain-stage on plugin if needed (only needed if input-level is very low)

#3: Adjust volume on your sound-system to taste.

#4: That's it. Enjoy the (hopefully) pleasing sound.

Now follows more in-depth info:

GUI
The GUI has 2 'lasers', 5 'lamps', 1 'wall-projector' and 5 mouse-controls.

The lamps:

Top-left:
"AutoEQ", warm white, always ON.
This is just a light showing the plugin's title.

Top-right:
"WORKING", red, ON when signal is detected and AutoEQ is active.

"READY WAITING", cool white, ON when no signal is currently detected but AutoEQ is ready and waiting for input.

Bottom-left:
"AFTERBURNER", warm white, ON when the processed-signal is 5 dB above the internal ceiling. This is just a warning that you may be in risk of running the signal-chain too hot for the dB FS scale, but does not indicate clipping in itself (not even on the dB FS scale). In hosts that can handle +dB FS levels AND if you intend your final sound-output to remain in a +dB FS level environment (for example; if exporting audio to 32 bit floating-point wave-files), this warning can be fully ignored.

Bottom-right:
"LIMITER", warm white, ON when output-limiter (limits all real* samples to a maximum of 0 dB FS) is active. Output-limiter may deteriorate the sound-quality if clipping occurs (see info on clipper, and how to avoid clipping, further below)
*Real samples defined here as samples actually measured in reality, at your host's current sample-rate, as opposed to interpolated virtual samples (AKA 'true')

Bottom-center:
"SUBWOOFER", magenta, ON when the deep-frequency program is active. This mode is LESS 'mix-translation friendly', is more 'bass heavy', and should generally only be used after careful consideration that extra bass is really what you want for your material (typically electronic music or 'club-sound')

The lasers:

Center:
"Ceiling-laser", magenta, ON when signal is processed. Think of this as a laser shooting a virtual ceiling-image towards you. When it appears to shoot above your eye-level; you are below the ceiling. When it shoots below your eye-level; you are above the ceiling. You want to be close to the ceiling (either at or just below it, but

not far above it)

"Spectrum-laser", green, ON when signal is processed. Think of this as a laser shooting a virtual spectrum-image towards you. The spectrum is auto-normalized, so it is not important if it is above or below your eye-level. It simply gives a general idea of how low vs high frequencies relate. For example; if the left side is higher than the right side; AutoEQ has adjusted the sound to be more 'bass-heavy'. If you get an inverted U-shape; AutoEQ has adjusted the sound to be more mid-frequency rich.

The mouse-controls:

Center-right:
"Input gain-stage", blue, vertical slider, always ON. Fully pulled UP (Click and hold left mouse-button to drag slider UP and DOWN, click and release right mouse-button to reset to default input-level (-24 dB FS)) the input-gain is 0 (zero) dB FS. Fully pulled DOWN the input-gain is -24 dB FS. Look at the 'ceiling-laser' while adjusting input-gain. No positive gain can be applied since AutoEQ is virtually input-level agnostic (it is not important to 'hit' the ceiling, just to be somewhere below it). Technically you do not HAVE to do proper gain-staging (unless audio is clipping! See info on clipper, and how to avoid clipping, further below) with AutoEQ, and can leave it at its default all the time.

Center-left/center:
"Comparison bypass", invisible, big yellow cross when active. Click and hold your left mouse-button (anywhere on the GUI left of the vertical gain-slider) to bypass the EQ-processing but maintain the output-gain. This is useful to make judgments on whether AutoEQ is improving your audio or not. The gain will not always match perfectly, but should in most cases be close enough to make a valid quality-comparison without your hearing being colored by gain-differences. If the original audio has already got the 'perfect' EQ (the spectrum-laser will be almost flat in such cases), as AutoEQ defines it, then you may not hear any or much difference at all between processed and bypassed audio.

"LIMITER", warm white, ON when output-limiter is active. Click and release your right mouse-button (anywhere on the GUI left of the vertical gain-slider) to toggle the limiter ON and OFF.

Near Bottom:
"Wet vs Dry level", dark-red, horizontal slider, always ON. Fully pulled LEFT and 'emtpy' looking (Click and hold left mouse-button to drag slider LEFT and RIGHT, click and release right mouse-button to reset to fully wet level, which is also the default level), AutoEQ outputs its wet signal (the fully processed signal). Fully pulled RIGHT and 'filled' looking, AutoEQ outputs its gain-compensated but otherwise fully dry signal (the same signal you get when 'comparison bypass' is ON (the signal you get when the big yellow X is showing)). You can use this slider to add some gain-compensated dry signal back into your audio-chain if you do not prefer the fully

processed signal. As with the 'comparison bypass'; the level-gain may not always match 100%, since the gain-compensation is based on the EQ. But it should definitely match closer than what you might get with a host's dry-wet option (where the dry signal would be obtained by bypassing AutoEQ's gain-compensation)

Bottom:
"SUBWOOFER", magenta, ON when the deep-frequency program is active. Click and release your left mouse-button to toggle the deep-frequency program ON and OFF.

The wall-projector:

Center:
"CLIP", warm white, 'projected' on the 'side-wall'. Comes ON whenever a real sample above 0 dB FS is hitting the limiter-stage (before the output-stage). If the output-limiter is ON, the actual output from AutoEQ will not technically go above 0 dB FS, but clipping may occur internally in AutoEQ (at the limiter-stage) and deteriorate the output sound-quality. If the output-limiter is OFF, the actual output from AutoEQ can go as high as it wants, provided your host supports +dB FS levels (be aware that in this mode AutoEQ may inadvertently, under certain conditions, output short spikes/bursts of sound-levels that go close to, or perhaps even above, +100 dB FS). Even though you can mix at +dB FS levels with AutoEQ; if you intend to export the audio to a standard 16 or 24 bit audio-file (Such as CD or MP3 files or similar), it is advised (this is just the author's subjective point-of-view, however, and can be ignored if you like the sound) to keep levels below the level that triggers the clip warning (since too much compression or limiting at your final output-stage (to bring levels back below 0 dB FS) can destroy most of the improvements AutoEQ attempts to make. Again; just the author's subjective POV, so if you like the sound; go with it)

The logo and plugin version info:

Bottom-left:
The 'breathing logo' will 'breathe' (brightness will continuously rise and fall slowly) to show that the plugin is running and not stopped or 'crashed'.
The link to the website (jelstudio.dk) (not clickable).
The date the plugin was last edited.

Technical concept (in general terms):

AutoEQ works by simulating a theoretically possible physical device (aka analog device) that operates in real-time.

The EQ 'color' is formed by capacitors in parallel.

Broadband signal-level is formed by capacitors in series.

Due to the design of the device; power-surges, leading to the device 'blowing up', are possible (but since this is obviously only a simulation of a physical device; the effect of such surges translates into large positive dB FS levels. Be aware that this can cause sound to be output at such high volume that it may be potentially dangerous to your hearing! Be extra careful until you get sufficiently acquainted with AutoEQ, as tinnitus and hearing-loss is no joke.)

Website: https://jelstudio.dk/JELSTUDIO_software.html
Email*: jelstudio@hotmail.com
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Facebook* (personal to Jacob Larsen): https://www.facebook.com/jacoblarsen.248

DSP programming: Jacob Larsen
GUI programming: Jacob Larsen
VST compiler: Derek John Evans

*If you receive 'weird nonsense' email/messages (like, for example, invitations to play Facebook games) from this account, it is NOT sent by JELSTUDIO!
Feel free to use Twitter/Facebook for communication instead of email if preferred.

Purchase link: https://sites.fastspring.com/jelstudio/instant/autoeq
(JELSTUDIO does not get your credit-card info, or other payment-details, only your email and your name and address)