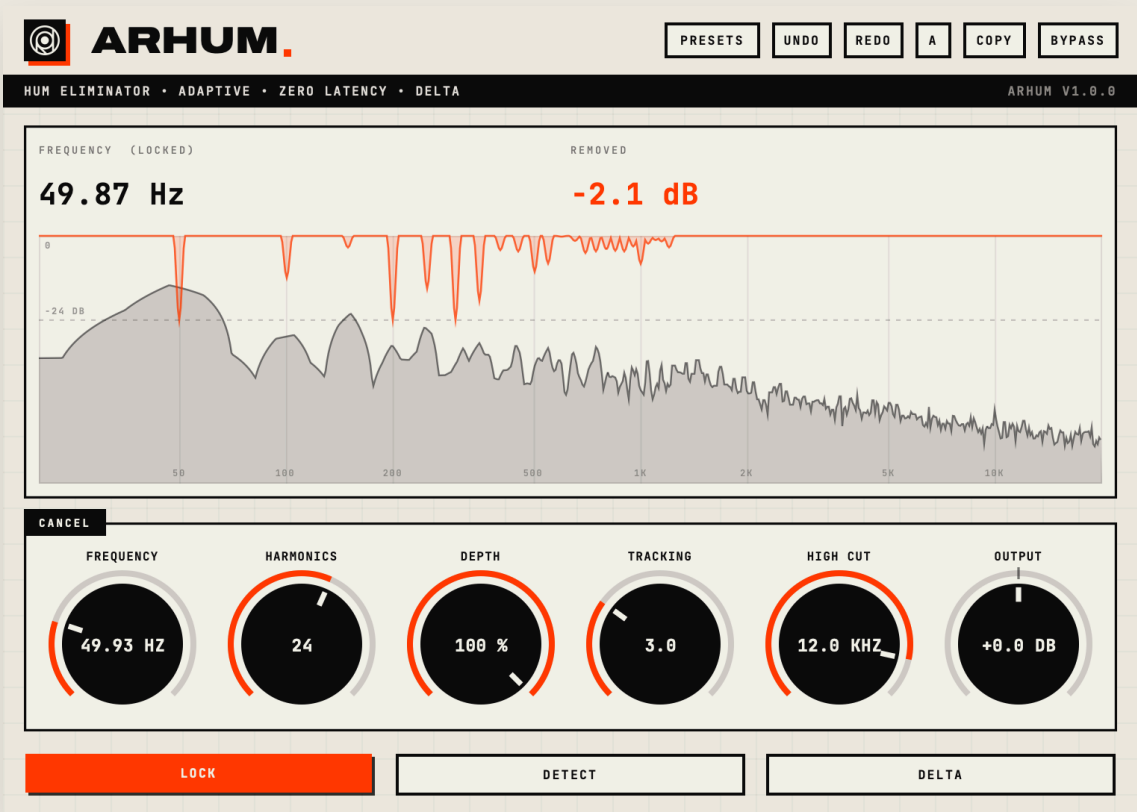


ARHUM

HUM ELIMINATOR



VERSION

1.0.0

FORMATS

AU • VST3

PLATFORMS

macOS • WINDOWS

DOCUMENT

USER GUIDE

01 WHAT IT DOES

ARHUM removes mains hum – the 50 Hz or 60 Hz tone that a single coil pickup, a long unbalanced cable or a badly grounded preamp adds to a recording – together with its harmonics, which is where most of what you actually hear as buzz lives.

It does this by **building the hum and subtracting it**, not by cutting the recording with filters. For every harmonic it keeps a sine and a cosine whose amplitude and phase it adjusts continuously until what it produces matches the hum in the recording. That estimate is then taken away. A bass note sitting on exactly the same frequency is not steady in the same way, so it survives.

The difference this makes is measurable. On a recording with a 100 Hz note lying directly on a comb tooth, the hum dropped **42.6 dB** while the note lost **1.5 dB** – a gap of 41 dB between the two. A notch filter deep enough to take 42 dB out of the hum would take the note with it.

ARHUM reports **zero latency**. Nothing is delayed, so it can sit on a track you are playing through.

02 INSTALLING

macOS

Run **ARHUM Installer.pkg** and follow the steps. You can choose which formats to install, and whether to install for every user or only for yourself. The package is signed and notarised by Apple, so it opens normally.

Windows

Run **ARHUM Installer.exe** and follow the steps. The plugin is placed in the shared VST3 folder. The installer is not code-signed, so SmartScreen may warn you: click **More info**, then **Run anyway**. This is only needed once.

After installing

Rescan the plugin list in your DAW. ARHUM appears under **Ajanss Records › ARHUM**.

03 FINDING THE RIGHT FREQUENCY

Everything else depends on this number being right. If ARHUM is aimed at 50.00 Hz and the hum is actually at 49.83 Hz, the harmonics drift further out with every step: the twentieth harmonic is then 3.4 Hz away from where it is being cancelled, and it is not cancelled at all.

DETECT does the measuring

Find a passage where the hum is audible and the music is not – a count-in, a gap between phrases, the tail of a track – and press **DETECT** while it plays. ARHUM scans only the two ranges where mains hum can be, 48.5–51.5 Hz and 60 Hz's, and it requires the fundamental to actually be present before it accepts a candidate.

That last requirement is not decoration. Guitar notes land on the harmonics of frequencies that are not the mains: G3 at 196 Hz, D4 at 294 Hz and G4 at 392 Hz are all whole multiples of 49.00 Hz, and a detector that only counted harmonic energy locked onto 49.00 Hz with total confidence. Tested against exactly that trap, with the guitar playing, ARHUM found **49.94 Hz** where the truth was 49.93 Hz.

LOCK follows the drift

Mains frequency is not constant. It moves with load across the day, by tenths of a hertz, and a long recording can start at 50.0 Hz and end somewhere else. **LOCK** watches the hum in the recording and follows it.

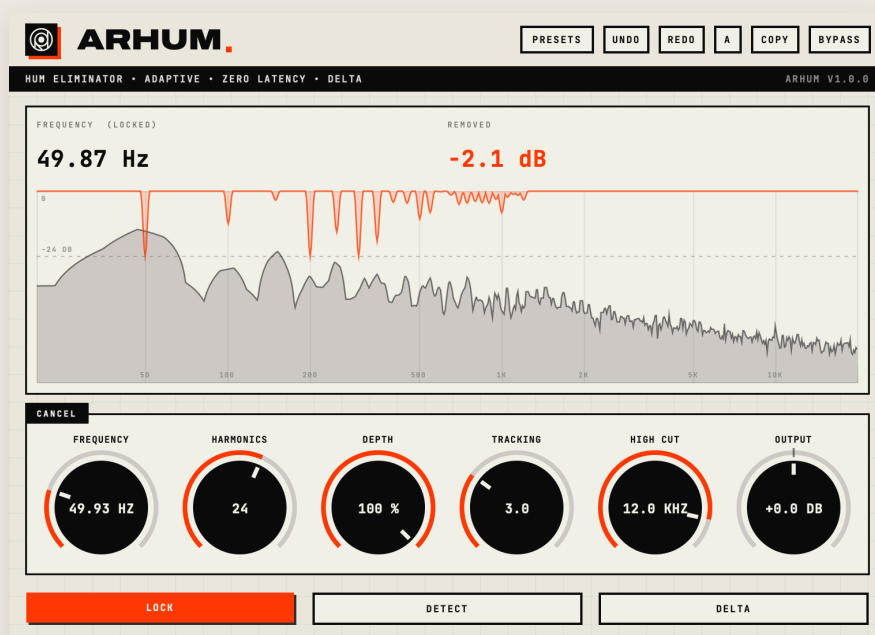
On a recording where the mains drifted from 50.0 to 50.4 Hz, ARHUM removed **37.5 dB** with LOCK on. With LOCK off, aimed at the frequency the recording started at, it removed **0.1 dB** – that is, nothing. Leave LOCK on unless you have a reason not to.

Turn LOCK off when the recording has no usable hum for it to follow: heavily edited material, something already treated by another tool, or a passage so loud that the hum never shows. A frequency that is held still is better than one that wanders after the wrong thing.

DELTA tells you what is leaving

DELTA plays only what ARHUM is removing. If you hear music in it, you are taking too much: lower DEPTH, reduce HARMONICS, or slow TRACKING down. What should be there is a steady buzz and nothing else.

04 THE INTERFACE



FREQUENCY

The frequency ARHUM is working at right now, and whether LOCK is holding it. While LOCK is following, this reading and the FREQUENCY knob will differ slightly – the knob is where you aimed, the reading is where the hum actually is.

REMOVED

How much is being taken out of the signal at this moment, in decibels.

THE ANALYSER

The spectrum of the incoming signal, filled in grey.

THE CURVE

What ARHUM is doing to the signal, drawn the way an equaliser draws it: a flat line at 0 dB with a notch at every frequency being cancelled. Its scale is marked on the left, from 0 down to -24 dB. The spacing of the notches is the working frequency, their number is HARMONICS, and they stop at HIGH CUT.

Each notch is as deep as the level at that frequency will actually drop, not as loud as the hum is: where the recording itself has something there, the notch stays shallow, because most of what is there is going to stay. They also sit where ARHUM is really working – if LOCK has followed the hum to 49.87 Hz, they land on multiples of 49.87.

05 CONTROLS

FREQUENCY 45 - 66 Hz	Where the fundamental is. 50 Hz across Europe, Asia and Africa; 60 Hz across the Americas and in parts of Japan. Use DETECT rather than guessing – the difference between 50.00 and 49.83 matters.
HARMONICS 1 - 40	How many multiples of the fundamental are cancelled. Hum on a bass DI is mostly the first few; the buzz of a single coil pickup runs much higher. More harmonics means more of the recording is being touched, so use the smallest number that does the job. On hum-free material, dropping from 24 to 5 harmonics reduced what ARHUM changed by 4 dB.
DEPTH 0 - 100 %	How much of the estimated hum is subtracted. 100 % takes all of it. At 50 % exactly half the amplitude is removed, which measures as 6.0 dB of hum left behind – useful when a completely silent background sounds wrong next to the rest of the record.
TRACKING 0 - 10	How quickly the estimate adapts. Low values take around thirty seconds to settle and are the safest on music; high values settle in a fraction of a second and can start following the recording itself. Raising TRACKING from the default 3 to 8 more than doubled what ARHUM changed on hum-free material.
HIGH CUT 100 Hz - 20 kHz	Nothing above this is touched, no matter how many harmonics are asked for. Lower it until the buzz stops improving.
OUTPUT -24 - +24 dB	Level after the processing.
LOCK	Follow the hum as the mains frequency drifts. On by default.
DETECT	Measure the hum frequency from what is playing and set FREQUENCY to it.
DELTA	Listen to what is being removed instead of what is being kept.
BYPASS	Passes the signal through bit for bit.

06 PRESETS

Fifteen starting points. Each one is a guess about how far up the harmonics reach and how fast the hum in that kind of recording moves – the frequency itself still comes from DETECT.

50 HZ (EUROPE, ASIA)	20 harmonics	60 HZ (AMERICAS)	20 harmonics
FUNDAMENTAL ONLY	1 harmonic	GUITAR AMP BUZZ	30 harmonics
SINGLE COIL	34 harmonics	SINGLE COIL (60 HZ)	30 harmonics
VOCAL BOOTH	12 harmonics	DIALOGUE	16 harmonics
DIALOGUE (60 HZ)	16 harmonics	BASS DI	8 harmonics
GENTLE (HALF DEPTH)	50 % depth	SLOW (PROTECT NOTES)	tracking 1
DEEP CLEAN	40 harmonics	FIXED (NO DRIFT)	lock off
LOW ONLY (BELOW 500)	10 harmonics		

Your own presets are saved next to these, in the **USER** tab of the preset browser. A keeps a second setting you can compare against, and COPY copies the current one into it.

07 STARTING POINTS

A guitar with single coil pickups

Load **SINGLE COIL**. Find a gap where the guitar is not playing and press **DETECT**. Leave **LOCK** on. If the buzz is still there but thinner, raise **HARMONICS**; if the guitar starts to sound dulled, lower **HIGH CUT** instead – that removes the top of the buzz without touching the low harmonics that are doing the useful work.

Dialogue with a hum under it

Load **DIALOGUE** and run **DETECT** on room tone before anyone speaks. Sixteen harmonics usually reach far enough for a voice recording, and a 6 kHz **HIGH CUT** keeps **ARHUM** away from the consonants entirely.

A bass DI that buzzes

Load **BASS DI**. This is where **TRACKING** matters most, because a bass note and the hum live at the same frequencies. Keep **TRACKING** at 2 or lower and check with **DELTA**: if you can hear the bass in what is being removed, the estimate is following the instrument. Slow it down further.

When you cannot find a silent passage

Set **FREQUENCY** by ear from where you are – 50 or 60 Hz – leave **LOCK** on, and give it time. **LOCK** converges on the hum in the recording without needing a gap; it is only slower.

Checking your work

Press **DELTA** and listen. Then press **BYPASS** a few times against the processed signal. If the record sounds the same except quieter in the background, you are done. If it sounds smaller, lower **DEPTH**.

08 WHAT WE MEASURED

Reported latency	0 samples
BYPASS	bit for bit
Steady hum, default settings	-42.6 dB
A 100 Hz note lying on a comb tooth, same pass	-1.5 dB
A 137 Hz note between the teeth	0.001 dB
Mains drifting 50.0 → 50.4 Hz, LOCK on	-37.5 dB
The same recording with LOCK off	-0.1 dB
DETECT under a guitar built to mislead it	49.94 Hz of 49.93
Change on hum-free material, default settings	-36.8 dB
DEPTH at 50 %	-6.0 dB of hum left

09 SUPPORT

For questions, bug reports and feature requests, please reach us on Instagram at [@ajanssrecords](#). Please include your operating system, your DAW and its version, the plugin format you are using, and the plugin version shown in the top right of the window.

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