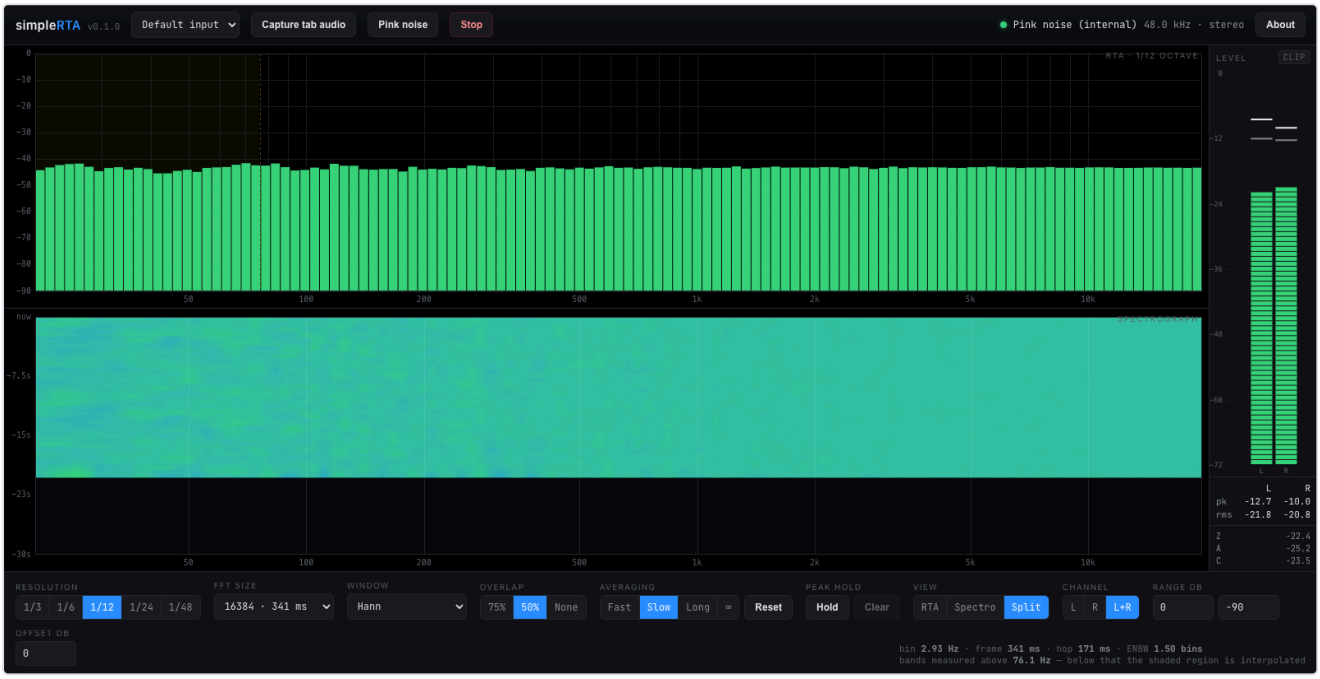
simpleRTA user guide

A real-time audio analyser that runs entirely in a browser tab. RTA, spectrograph and a level meter, sharing one frequency axis.



Split view on the built-in pink noise. ***Pink noise is flat on a constant-percentage-bandwidth display, so a correct analyser draws a level line*** *— which is what makes this the picture worth checking a change against.*

> **Before you rely on this:** the analysis chain is verified numerically — 29 tests pin the power normalisation at every transform size and through every window, the band-integration invariants, and the agreement between the band levels and the spectrum they come from. The running app is checked against its own pink-noise source.
>
> **It has not been verified against a calibrated measurement microphone or a reference analyser, and no absolute SPL claim is made.** The dB offset field is an unverified number you supply, and **there is no microphone correction.**
>
> This codebase was created with AI assistance, directed and reviewed by a human author.

Start on pink noise

Pink noise is generated in the page and analysed without going anywhere near the speakers.

Because pink noise is flat on a constant-percentage-bandwidth display, a correct analyser draws a level line. **That is the check that the analyser reads level, before you trust what it says about a room.** Do it once, on any new machine or browser.

Sources

An audio input — a microphone, a measurement mic on an interface, or a return from a console. The browser's **echo cancellation, noise suppression and automatic gain are all switched off**, so what you see is the signal rather than the voice pipeline the browser would otherwise hand you.

Tab audio — captures what another browser tab is playing. Pick a tab in the picker and tick *Share tab audio*. **Whole-window and full-screen shares carry no audio on most platforms.** Chrome and Edge only.

Pink noise — as above.

Reading the display

Levels are **dBFS**, on the convention that a full-scale sine reads 0 dB.

The **offset** field adds a constant to everything shown, so with a reference of known level you can dial the scale into SPL. **Nothing verifies that number, and no microphone correction is applied** — so it is a working scale, not a measurement.

The shaded region is arithmetic, not a fault

At the fine resolutions **the low bands are narrower than the transform can actually resolve.** Below the frequency stated under the controls, neighbouring bands report *shares of a single measurement* rather than independent ones, and the RTA shades that part of the graph.

It is the arithmetic of asking a 341 ms transform for 1/48-octave detail at 30 Hz. **Lengthen the transform, or use a coarser resolution, and the shading recedes.**

Resolution	16384-point transform, 48 kHz	65536-point
1/3 octave	resolved from 20 Hz	20 Hz
1/12 octave	76 Hz	19 Hz
1/48 octave	304 Hz	76 Hz

Do not read a difference inside the shading as a difference in the room.

Which window

Hann	Anything ordinary.
Blackman-Harris	To see a quiet tone next to a loud one — it buys −92 dB sidelobes at the cost of a wider main lobe.
Flat-top	When the **amplitude** of a tone matters more than its frequency: accurate to about 0.01 dB wherever the tone falls between bins, with poor frequency resolution in exchange.
Rectangular	Only for signals that are periodic within the frame.

Flat-top is the one people reach for too rarely. If you are matching levels between two tones, Hann will cost you up to 1.4 dB depending on where the tone lands.

What else is on screen

- **RTA** at 1/3, 1/6, 1/12, 1/24 or 1/48 octave
- **FFT size** 2048 to 65536, with a selectable window and overlap
- **Peak hold** per band, and exponential or infinite averaging
- **Spectrograph** sharing the RTA's frequency axis
- **Full-height bargraph meter** — peak, RMS, peak hold and a latching clip indicator, plus broadband Z / A / C readouts

No backend, no accounts, no telemetry. The audio is analysed on the page and never leaves the browser.

If something looks wrong

Symptom	Cause
Pink noise does not draw flat	Something is wrong before you look at any room. Check the source and the offset.
The low end is shaded	The transform cannot resolve those bands. Lengthen it or coarsen the resolution.
Tab audio is silent	Whole-window and full-screen shares carry no audio on most platforms. Pick a tab.
Two tones read different levels at the same amplitude	Window scalloping loss. Use flat-top.
The SPL number is wrong	It is your offset. Nothing here verifies it, and there is no mic correction.