

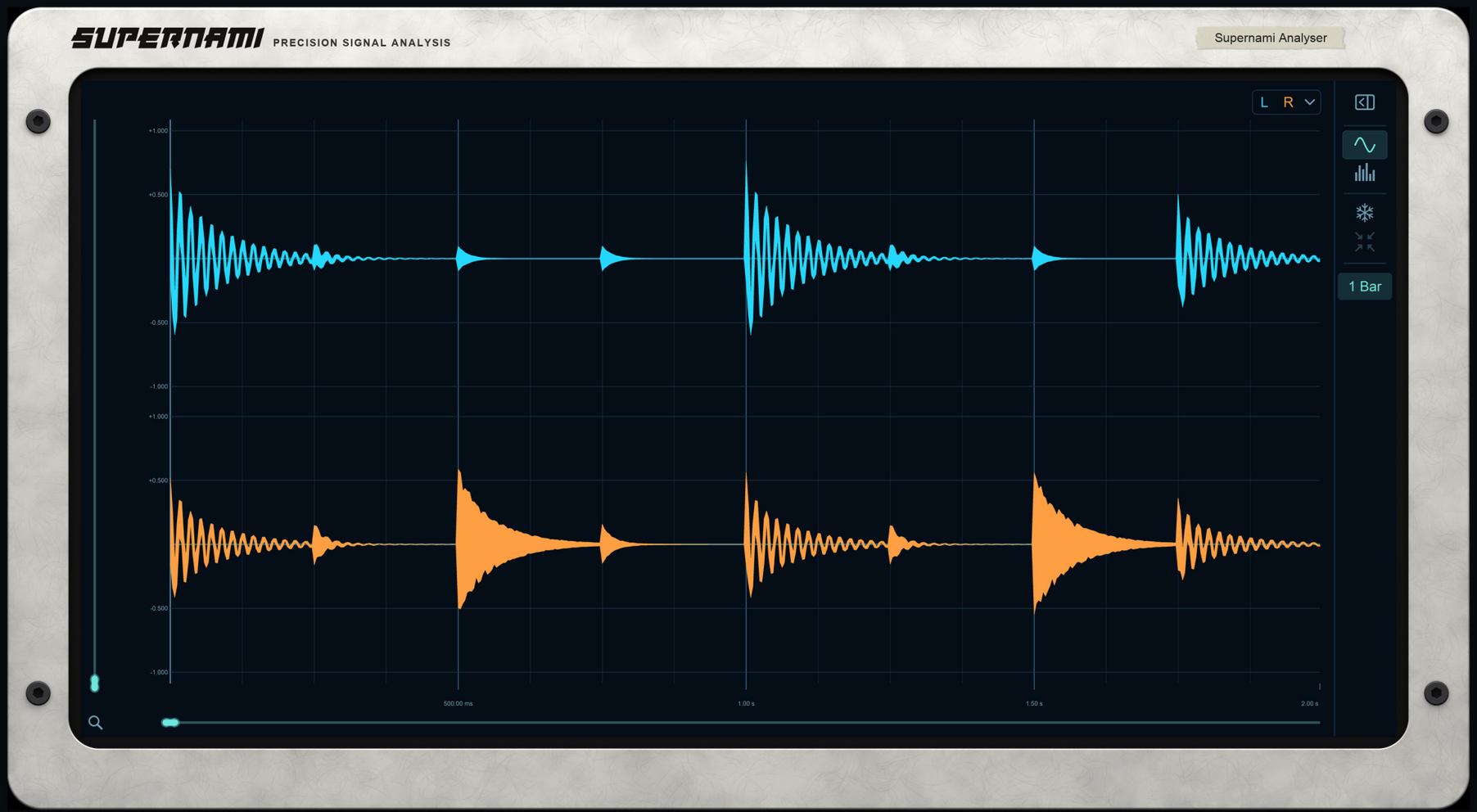
SUPERNAMI

OPERATIONAL MANUAL

TOKI STUDIOS

Supernami

Precision signal analysis



SUPERNAMI · 6U SCOPE / SPECTRUM ANALYSER

WELCOME

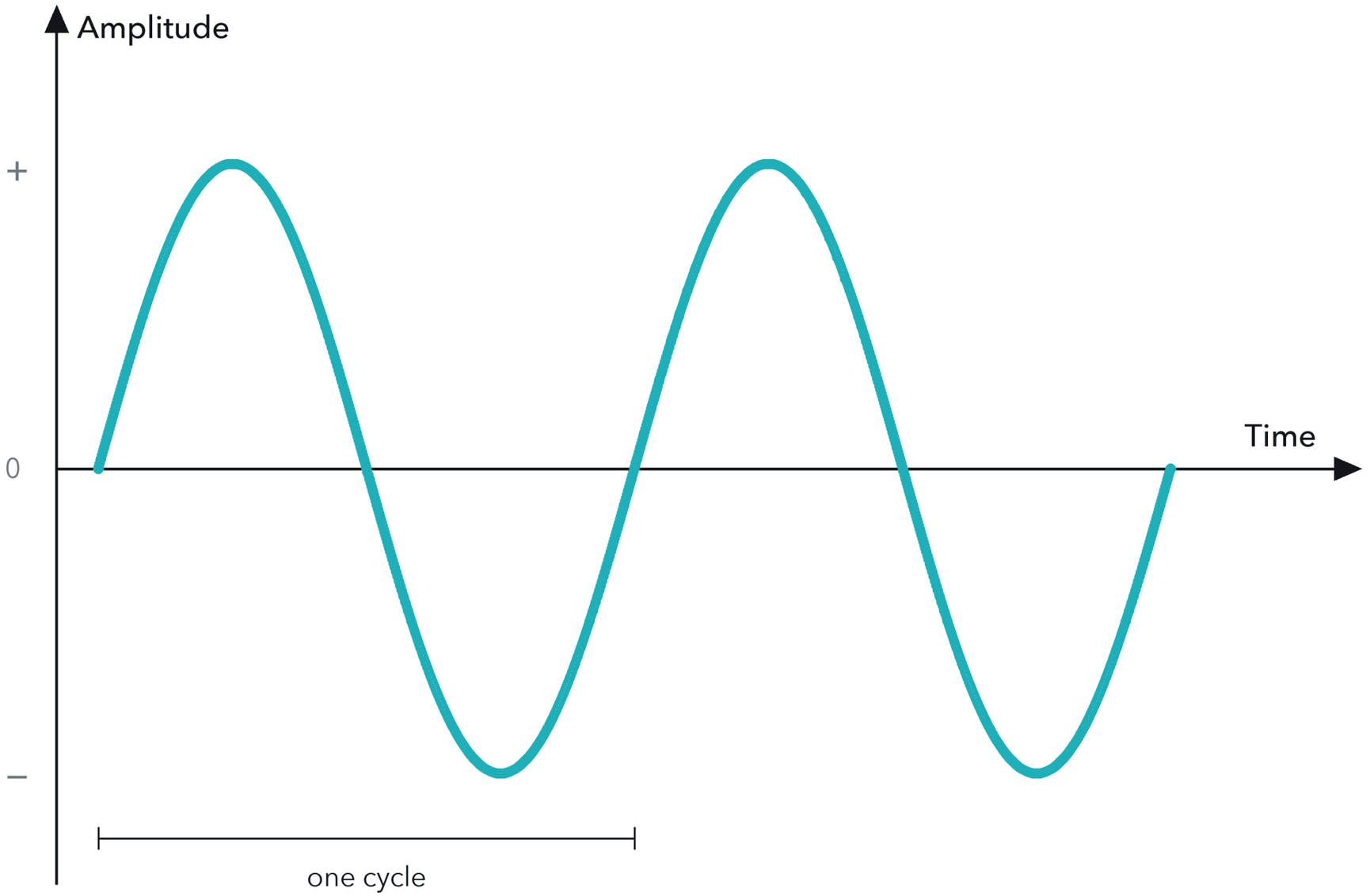
Supernami shows you what your audio is doing.

Put it anywhere in your signal chain. The sound passes straight through, sample for sample, never changed. Supernami only watches.

SCOPE	See the wave, locked to your song.
SPECTRUM	See the notes, and read them by hovering.
TRANSPARENT	Your audio is never altered.

CONTENTS

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Scope	9	Piano roll and hover	31
Windows	11	Mid / Side	35
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Amplitude
+
0
−
Time
one cycle

A waveform is sound drawn over time.

Up is more air pressure, down is less.

The height of the wave is its amplitude: the strength of the signal.

The width of one cycle sets the pitch: shorter cycles sound higher.

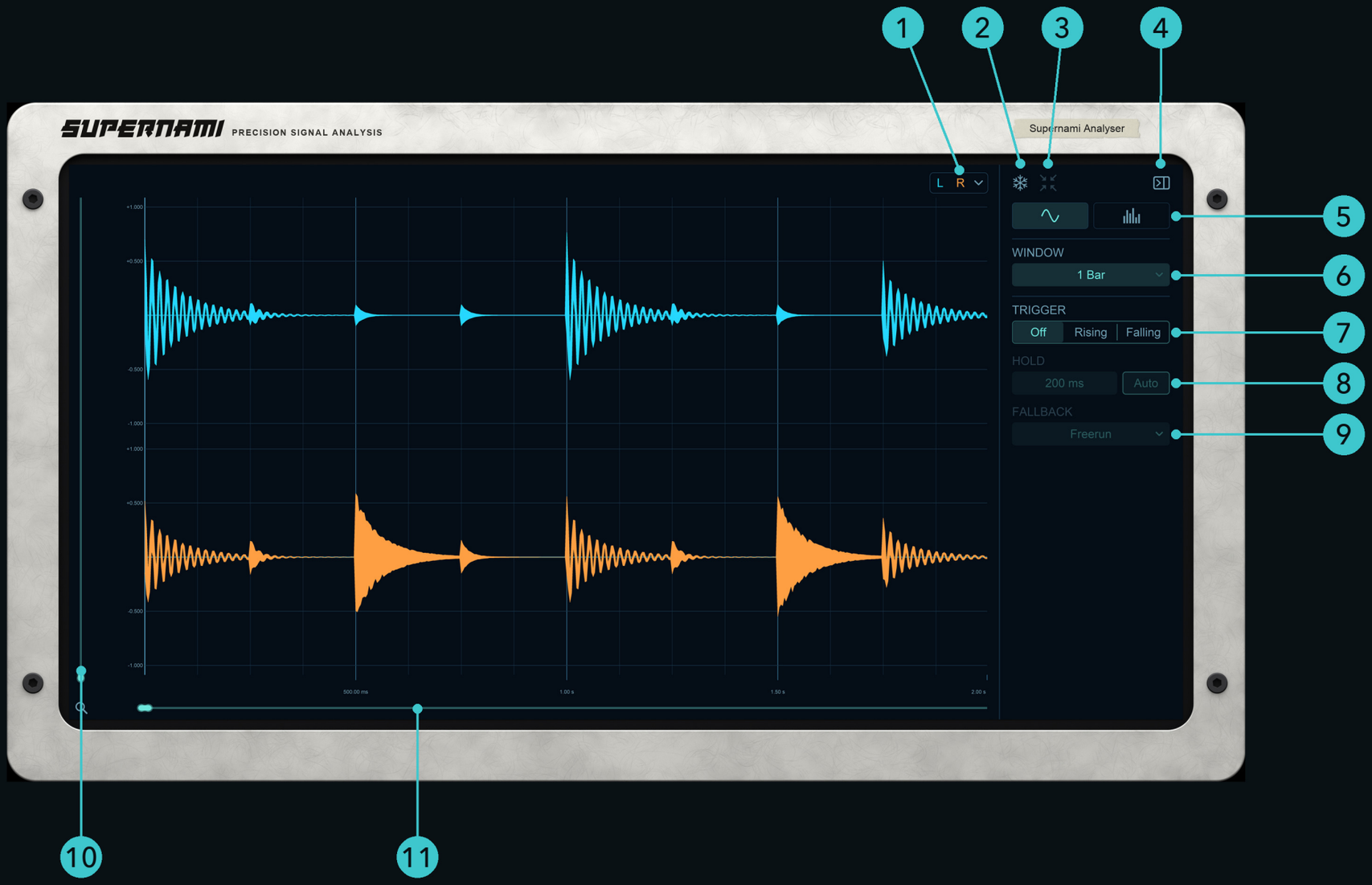
THE PANEL

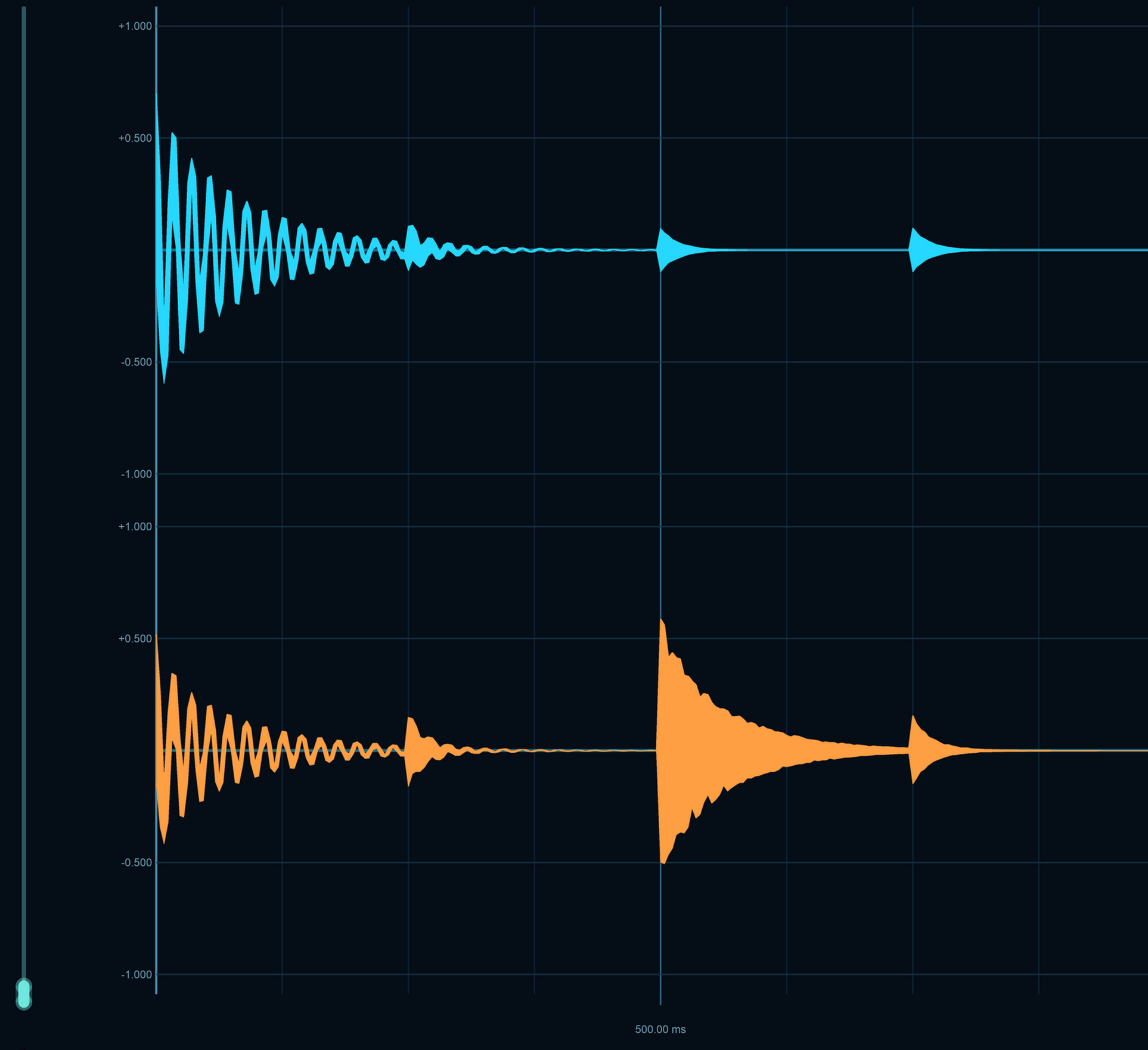
Everything lives in the display.

No knobs. Each control sits where you use it.

1. **Source**
   Left, Right, L/R, Mid, Side or M/S.
2. **Freeze**
   Stops the picture. The zooms keep working.
3. **Recentre**
   Reset the level (up / down) position. Scope only.
4. **Inspector**
   Fold it down to a slim bar, or open it again.
5. **Scope | Spectrum**
   Switch between the two views.
6. **Window**
   Free, or a musical length locked to your song.
7. **Trigger**
   Off, Rising or Falling signal trigger.
8. **Hold and Auto**
   How long a catch stays on screen, 1 ms to 1 s. Auto keeps the picture moving.
9. **Fallback**
   Freerun or Hold/Wait when nothing crosses the Threshold.
10. **Y Zoom**
    Zoom the level. The slider on the left edge.
11. **X Zoom**
    Zoom the time, from 2 s to 1 ms. The slider along the bottom.

The Spectrum tab adds Reading, Decay and Piano Roll: pages 21 to 32.


SUPERNAMI
PRECISION SIGNAL ANALYSIS
Supernami Analyser
L R
WINDOW
1 Bar
TRIGGER
Off
Rising
Falling
HOLD
200 ms
Auto
FALLBACK
Freerun
1
2
3
4
5
6
7
8
9
10
11


+1.000
+0.500
-0.500
-1.000
+1.000
+0.500
-0.500
-1.000
500.00 ms

SCOPE

Watch the wave.

Supernami draws your audio as it plays, left to right,
with about four seconds of history to zoom and pan through.

SOURCE	Left, Right, L/R, Mid, Side or M/S.
X ZOOM	Time, from 2 s down to 1 ms. Slider along the bottom.
Y ZOOM	Level. Slider on the left edge.
DRAG	Pan. Cmd-drag zooms time, Shift-drag zooms level.
FREEZE	Stops the picture. The zooms keep working.

ON THE BENCH

See why a kick is deep



GOAL
Read a kick's note from its cycles: why it's deep.

SET
Source Left, Trigger Rising
X Zoom about 40 ms

SEE
Each cycle about 18 ms:
a fundamental near 55 Hz.

WINDOW

Lock the picture to your song.

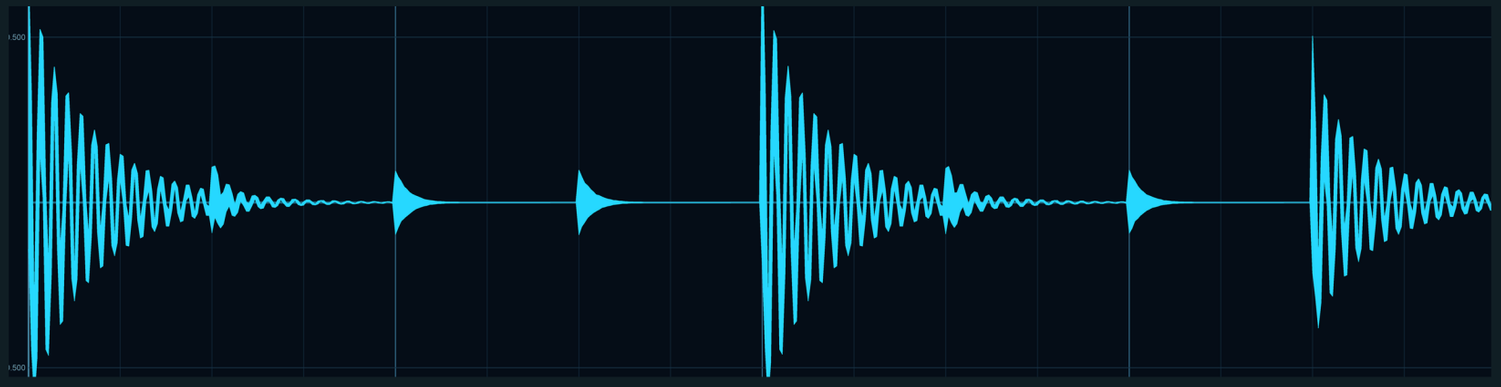
Choose a musical Window and every pass starts on the song's grid, so a repeating part prints in the same place each time.
Bar, beat and 16th lines are drawn under the trace.

Free	1 Bar	1/2	1/4	1/8
1/8T	1/16	1/16T	1/32	1/32T

T means triplet. Free runs on seconds. With the transport stopped, a Window runs free.

ON THE BENCH

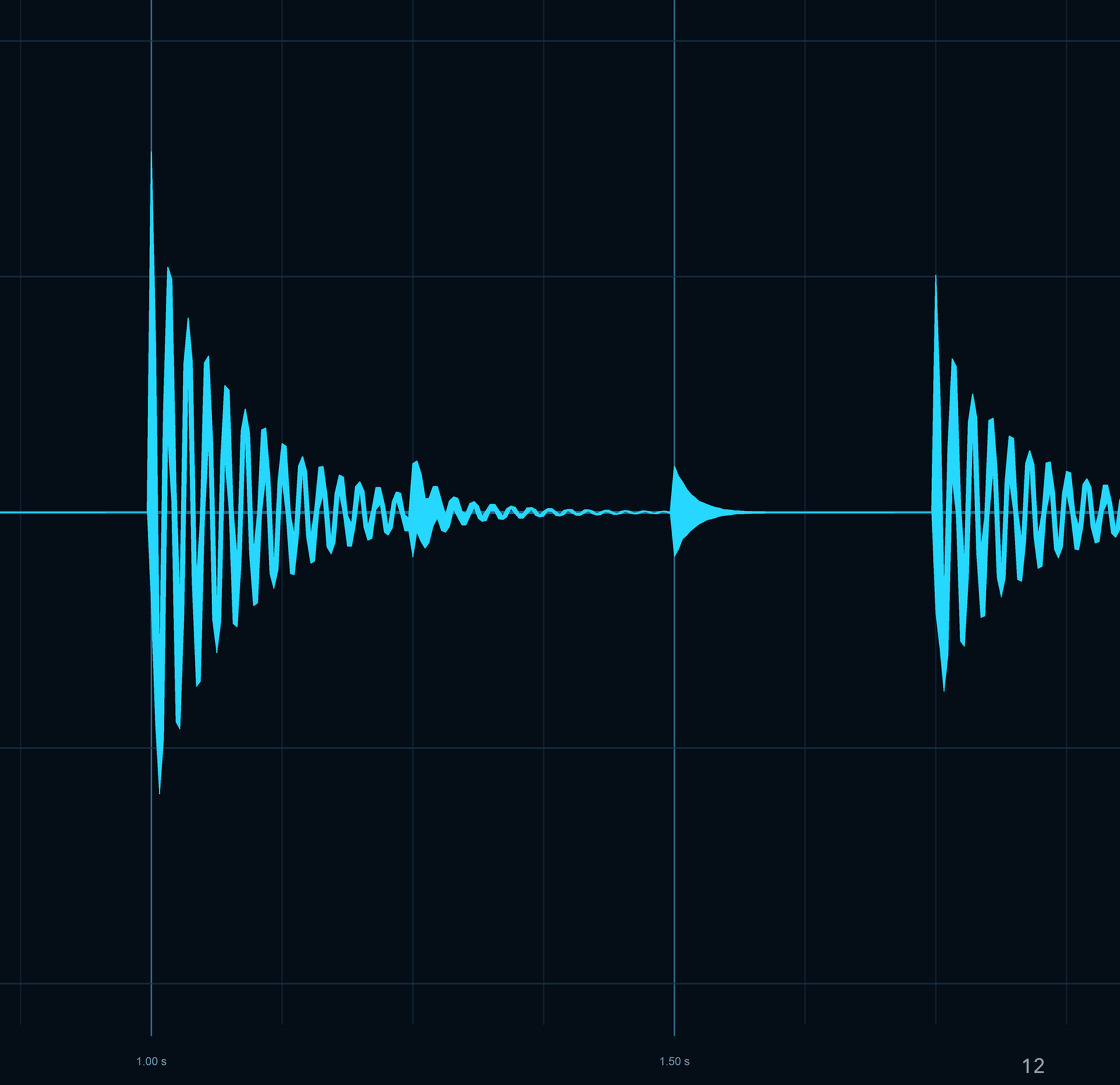
Check a groove sits on the grid



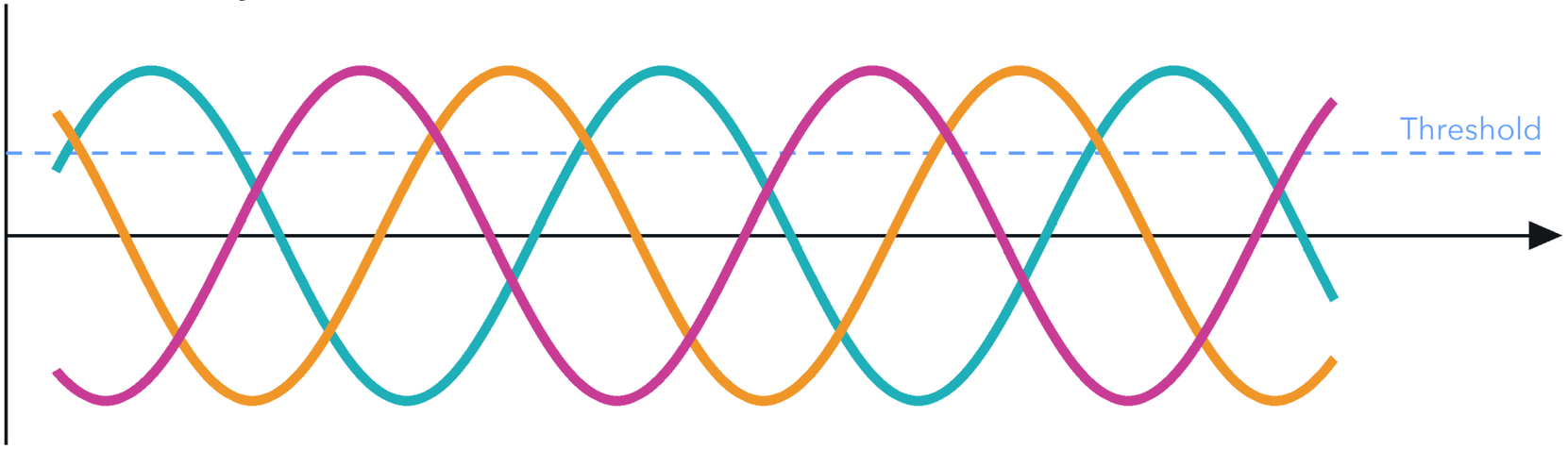
GOAL
Hear a groove and see where each hit falls.

SET
Source Left
Window 1 Bar

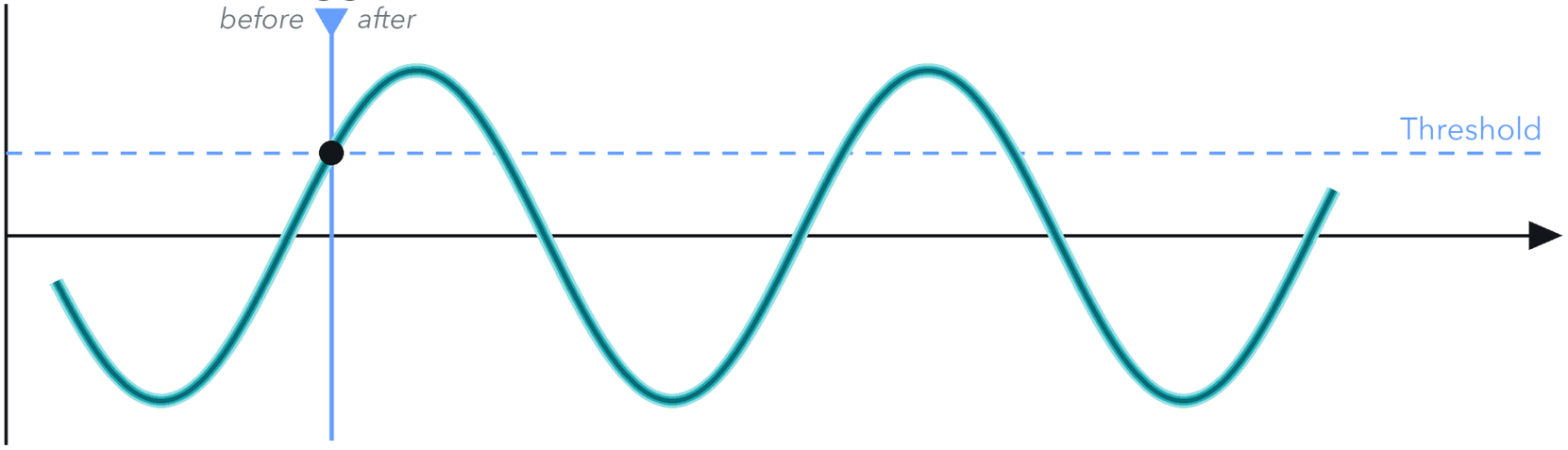
SEE
Hits sit on the beat lines, the same every bar.


1.00 s
1.50 s

Window only every pass starts on the grid, but the cycles don't fit the bar



Window and Trigger every pass starts where the wave crosses the Threshold



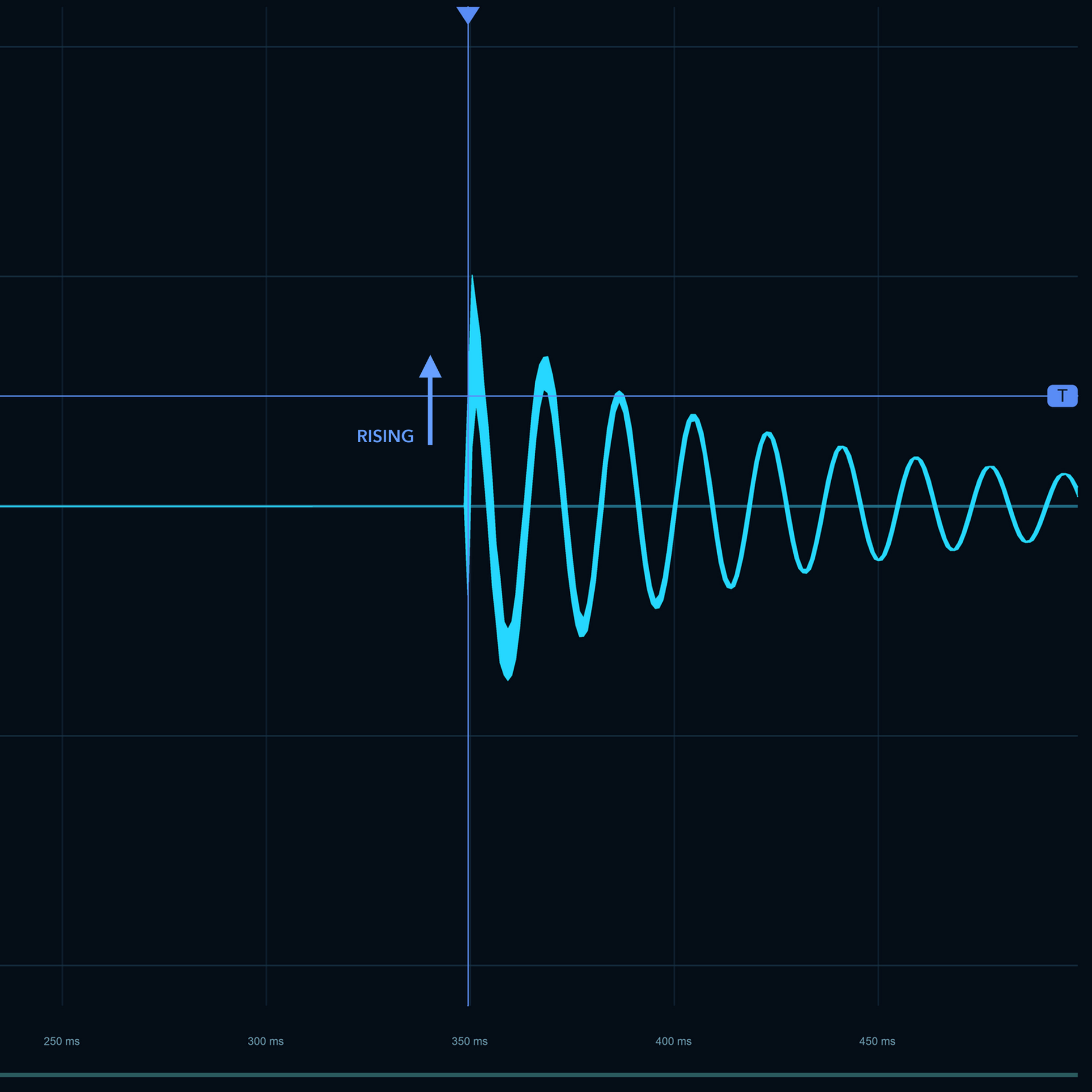
three passes, one line

The Window follows the song. The trigger follows the signal.

A Window starts every pass on the beat or bar. That holds a drum hit still, because the hit starts on the grid.

A held note, a live part, or any sound whose cycles don't fit the bar starts each pass at a different point of its wave, so the picture slides. At 130 BPM, a 55 Hz note makes about 101.5 cycles a bar: half a cycle off each pass.

A trigger starts each pass where the signal crosses your level. It works in any Window, and the wave holds still when the signal repeats.


RISING
T
250 ms
300 ms
350 ms
400 ms
450 ms

TRIGGER

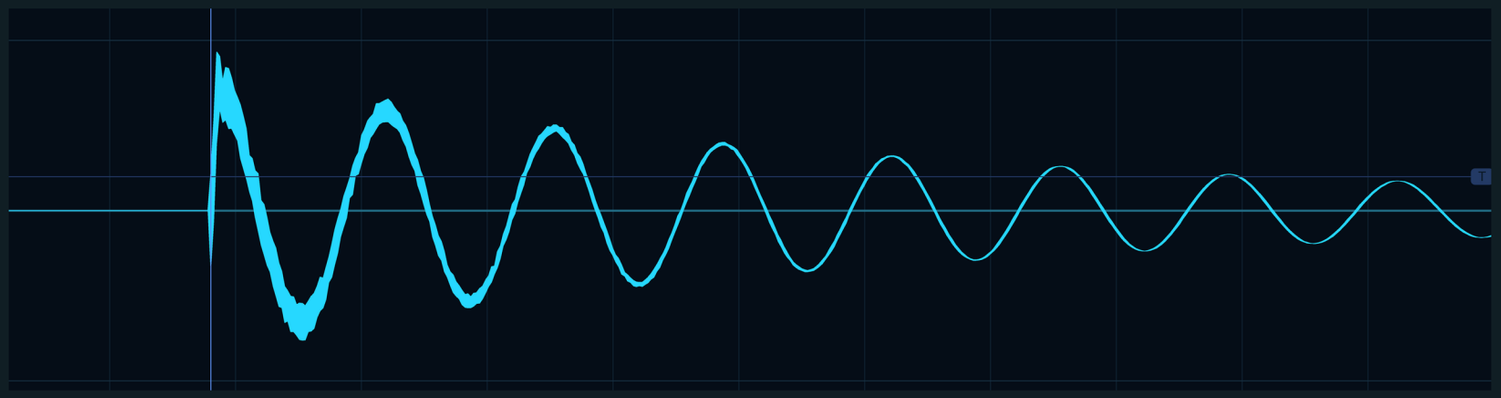
Catch the moment.

Start each picture where the signal crosses a level you set, so a hit prints in the same place every time.

TRIGGER	Off, Rising or Falling: the direction the signal crosses the Threshold to start a catch.
THRESHOLD	The level. Drag the line. Auto follows the signal for you.
POSITION	Drag the marker to place the catch. Left of it is what came before the trigger, right of it what follows.
HOLD	How long a catch stays, 1 ms to 1 s.
FALLBACK	Freerun keeps drawing when nothing crosses; Hold/Wait keeps the last catch.

ON THE BENCH

Hold a kick still

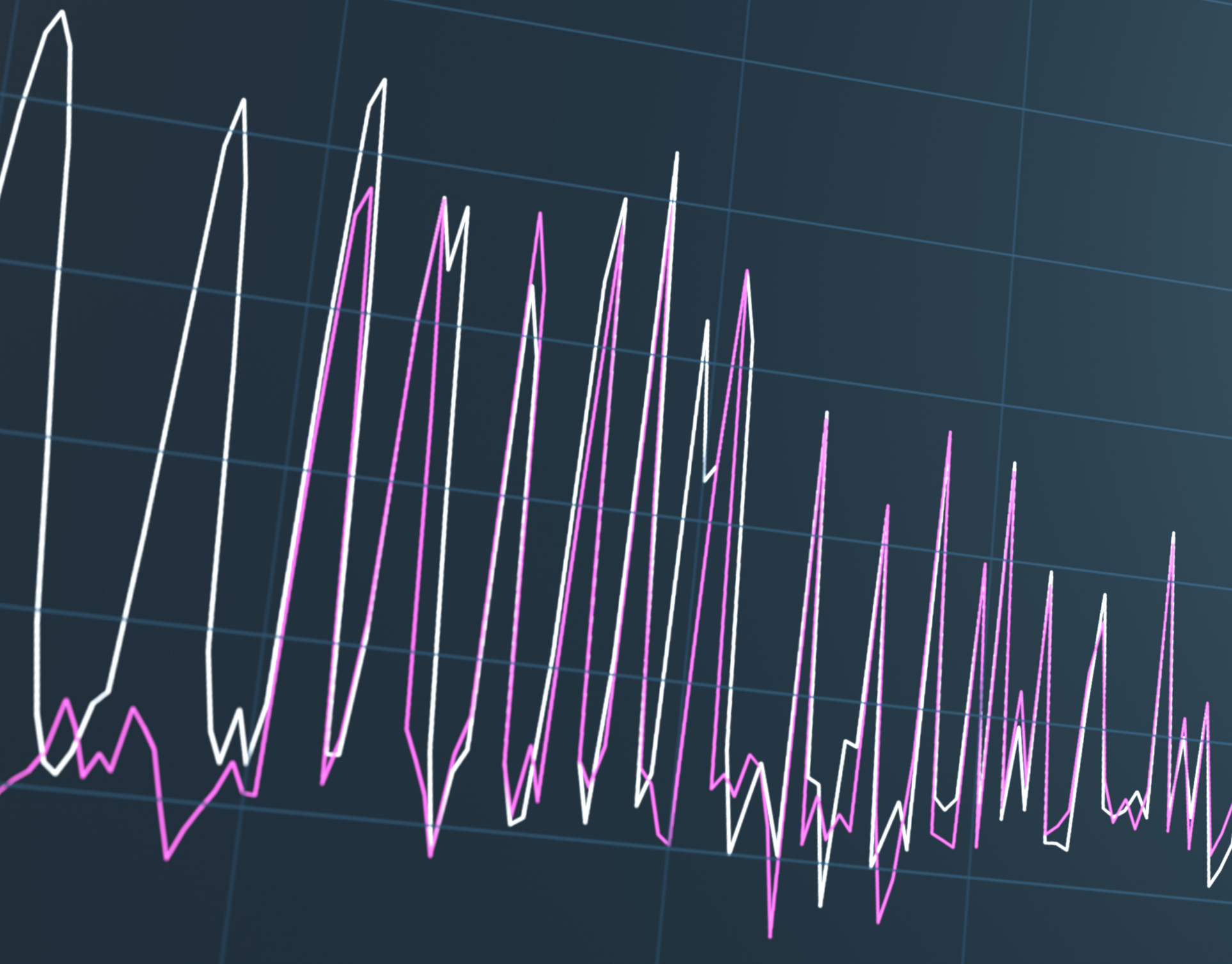


GOAL
See a kick land in the same place every time.

SET
Source Left, Trigger Rising
Threshold across the attack

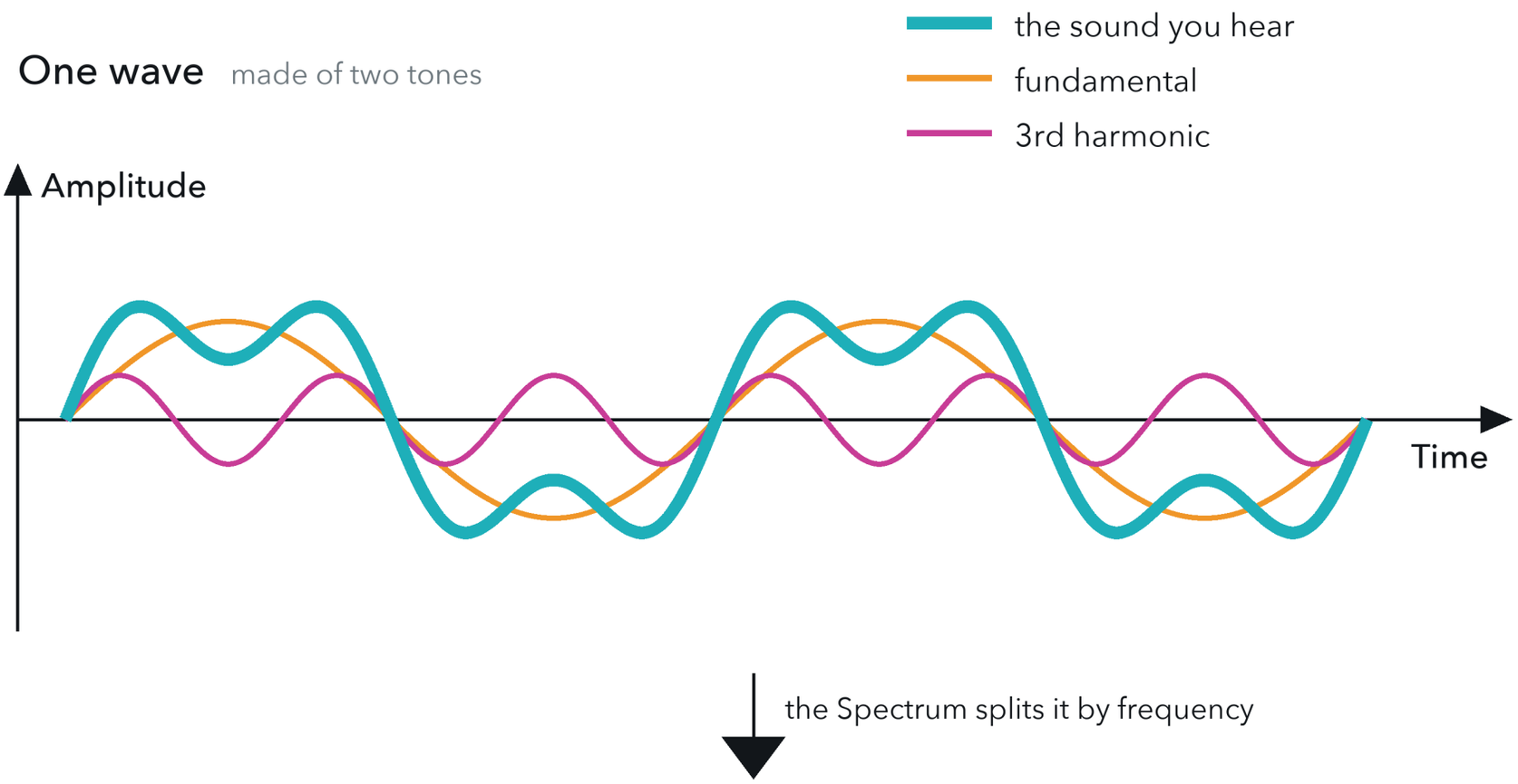
SEE
The attack sits on the marker, pass after pass.

See what you hear.

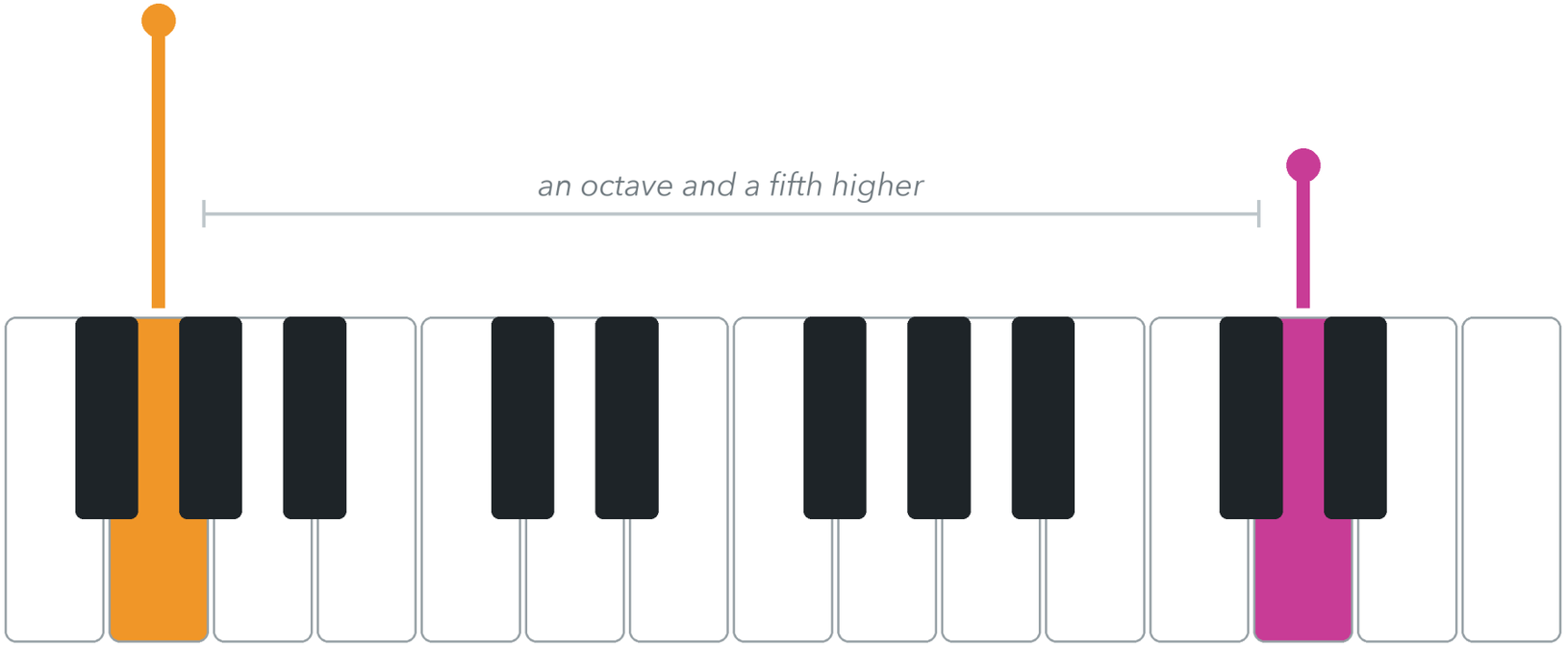



READING
Peak
White
DECAY
1000 ms
PIANO ROLL

One wave made of two tones



the Spectrum splits it by frequency



fundamental
100 Hz

3rd harmonic
300 Hz

Every sound is a sum of tones.

Most notes are a stack of tones: a fundamental and its harmonics.

Split a wave into simple tones and each has its own frequency and its own level.

Frequency is cycles per second, in Hertz (Hz). The Spectrum draws pitch across the page and level up it, so you can see every tone at once.

Most instruments add many more. Two are shown here.

SPECTRUM

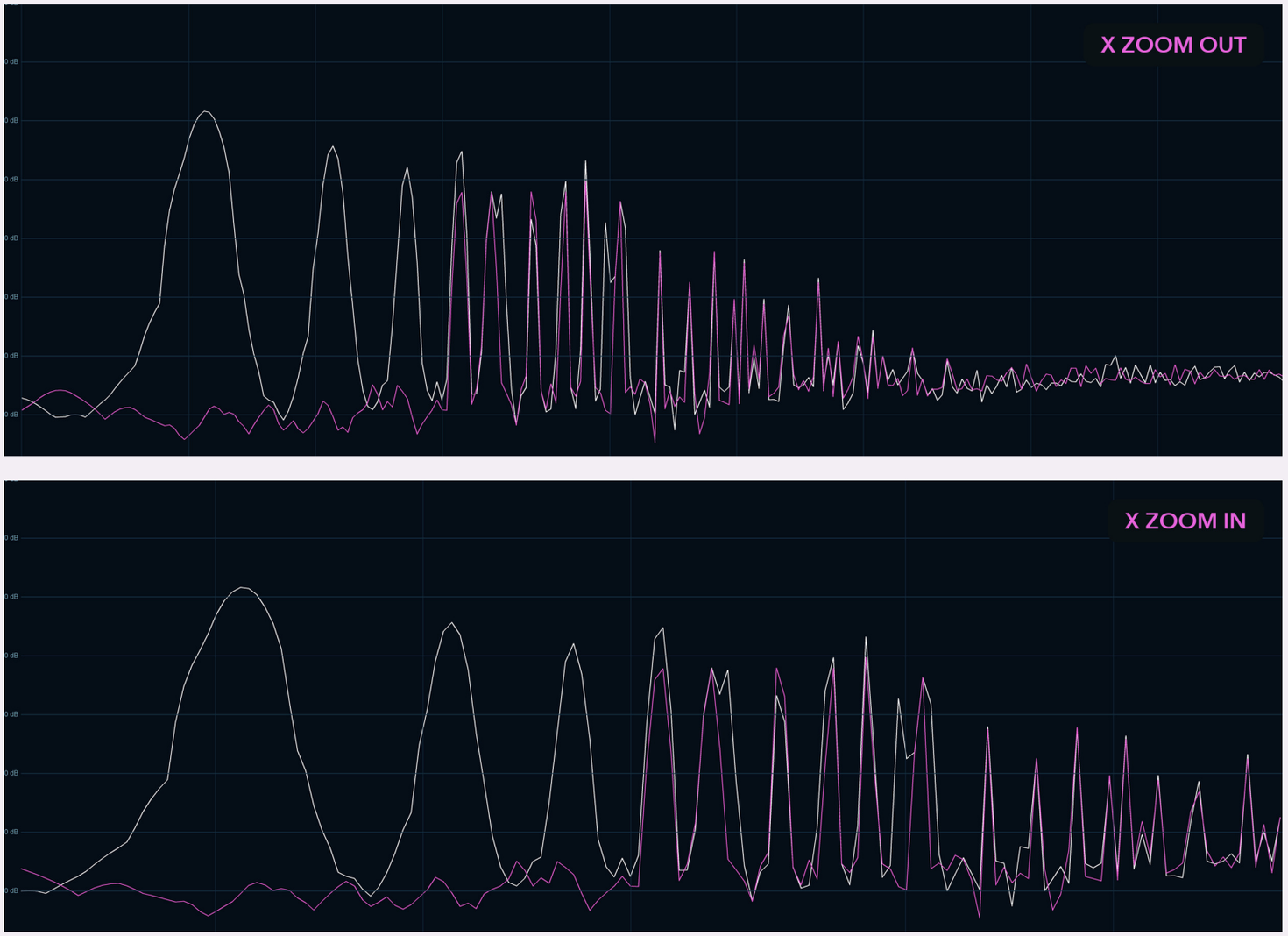
See every tone.

Supernami splits your audio into 256 bands, from 20 Hz to 20 kHz. They are spaced like musical pitch, each about 47 cents wide, so every octave gets the same detail.
Each band shows its level from -80 dB to +20 dB relative to full scale (dBFS), so hot signals stay in view.

SOURCE	Left, Right, L/R, Mid, Side or M/S.
X ZOOM	Frequency. Slider along the bottom.
Y ZOOM	Level, in dB. Slider on the left edge.
DRAG	Pan. Cmd-drag zooms frequency, Shift-drag zooms level.
DECAY	How slowly each band falls, 100 ms to 2 s.
FREEZE	Stops the trace. The zooms keep working.

ON THE BENCH

Look closely at the bass



GOAL

Separate the bass harmonics.

SET

Source M/S, X Zoom in, drag to pan

SEE

The bass sits in Mid (white); Side (magenta) stays low.

Level, on a scale that fits your ears.

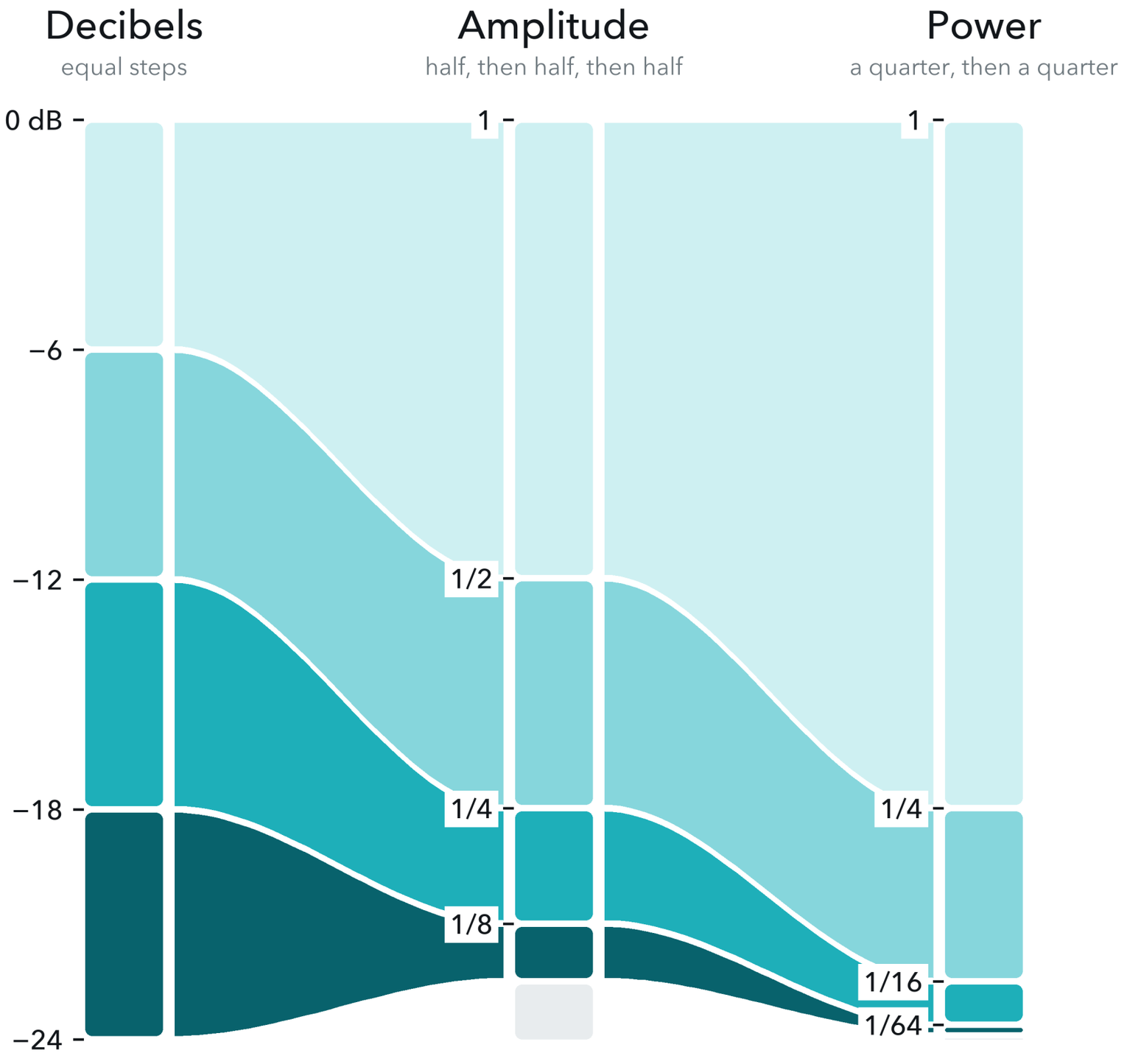
The same level can be measured three ways: amplitude, power and decibels. Supernami uses two: amplitude on the Scope and dB on the Spectrum.

Amplitude is the height of the wave: what the Scope draws, from −1 to +1.

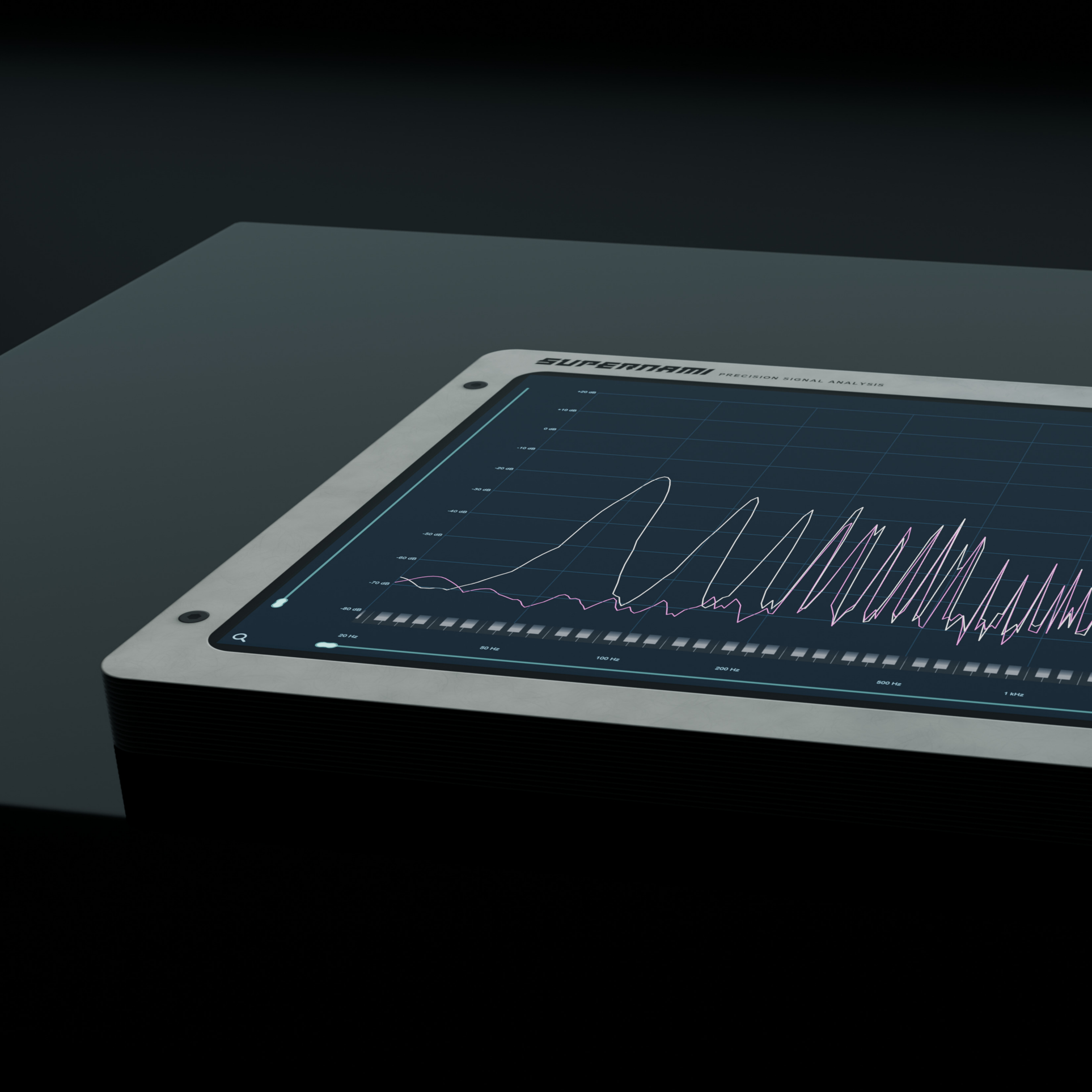
Power is the energy in it: the height times itself. Half the height is a quarter of the power.

Decibels turn those into equal steps. Every 6 dB is half the amplitude and a quarter of the power. Every 20 dB is a tenth and a hundredth.

Faders, meters and EQs use dB because each step sounds like the same change. +6 dB doubles the height, +3 dB doubles the power, and about +10 dB sounds twice as loud.



Each step is 6 dB quieter. Decibels keep every step the same size; amplitude and power crush the quiet ones.


SUPERNAMI
PRECISION SIGNAL ANALYSIS
+20 dB
+10 dB
0 dB
-10 dB
-20 dB
-30 dB
-40 dB
-50 dB
-60 dB
-70 dB
-80 dB
20 Hz
50 Hz
100 Hz
200 Hz
500 Hz
1 kHz


Supernami Analyser
M
S
READING
Peak
White
Pink
DECAY
1000 ms
PIANO ROLL
On
2 kHz
5 kHz
10 kHz
20 kHz

Why noise has a colour.

Noise is every frequency at once, but not in equal amounts. The mix gives it a colour.

White noise has the same level at every frequency: jagged. Pink noise falls 3 dB each octave, so every octave carries the same energy: rugged mountains. Brown noise falls 6 dB an octave: rolling hills, and a deep rumble.

A Reading only tilts the picture. White draws noise as it is, so white noise lies flat. Pink tilts everything up 3 dB an octave, so pink noise lies flat instead.

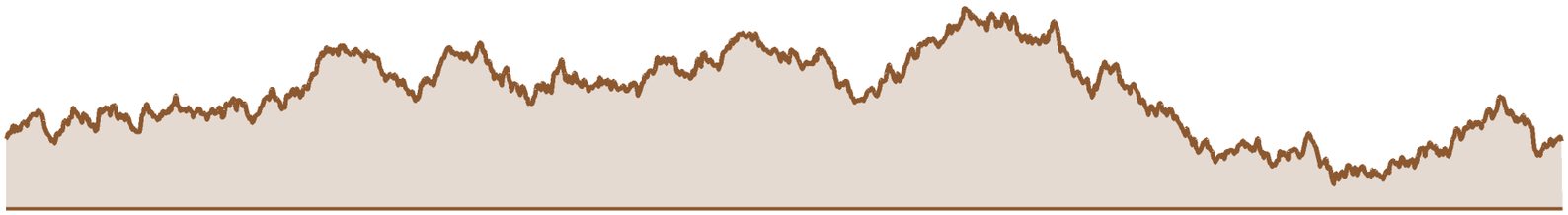
Choose the Reading where your test noise is flat. Any bump or dip you then see is the device.



White jagged, every size equal



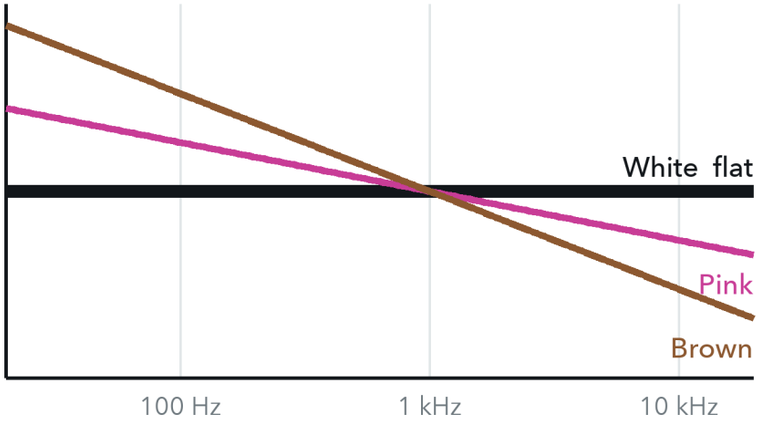
Pink rugged mountains



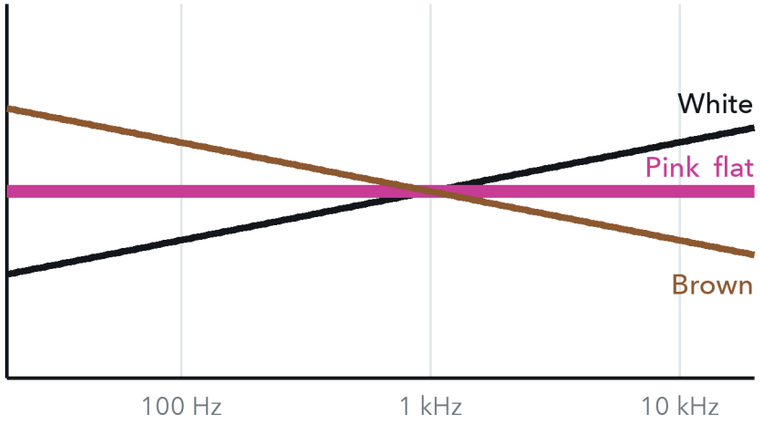
Brown rolling hills

The noise itself, drawn as it moves in time. Every run looks a little different.

White reading: noise as it is



Pink reading: tilted up 3 dB an octave



SPECTRUM READING

One signal, three readings.

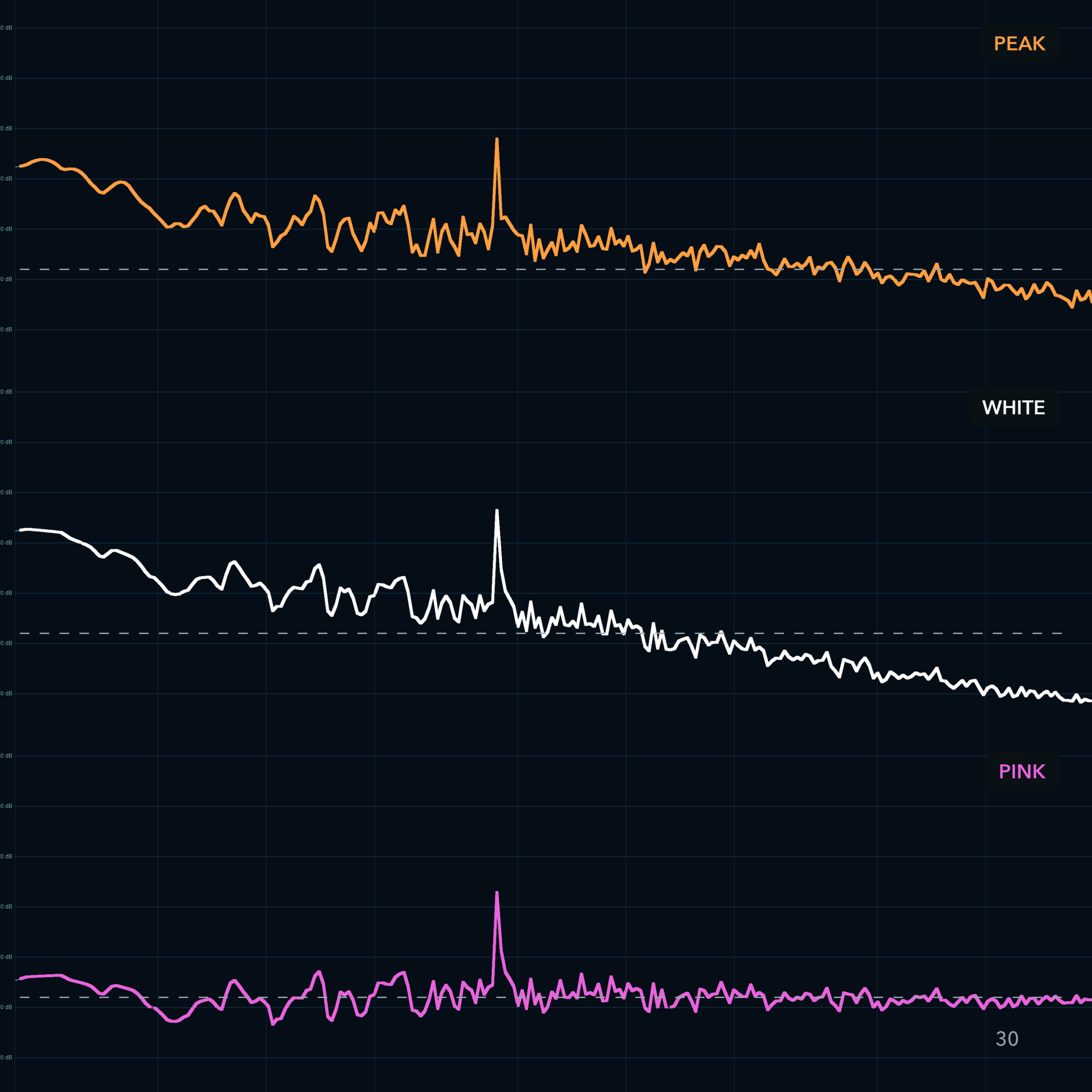
Each reading compensates for a different noise spectrum.

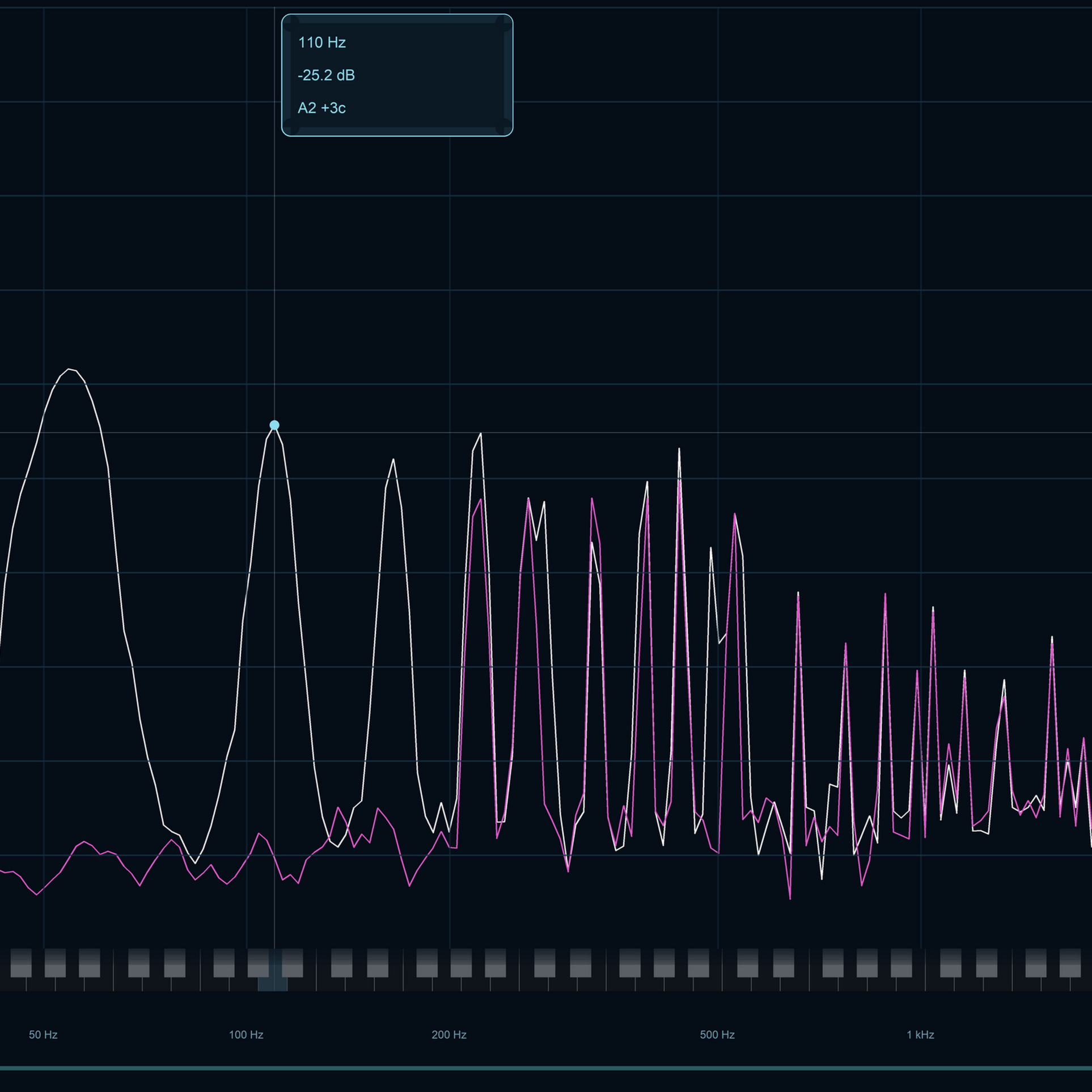
PEAK	No compensation: a tone reads at its own level.
WHITE	Flat for white noise. Pink noise slopes down.
PINK	Flat for pink noise. White noise slopes up.

On the bench

Send pink noise through an EQ or a filter and set Reading to Pink. The curve you see is the device's frequency response, so you can check it by eye.

Opposite: the same signal, pink noise and a 440 Hz tone, read three ways. Pink noise falls 3 dB an octave, so only the Pink reading draws it flat. The dashed line marks flat.


PEAK
WHITE
PINK
30


110 Hz
-25.2 dB
A2 +3c
50 Hz
100 Hz
200 Hz
500 Hz
1 kHz

PIANO ROLL AND HOVER

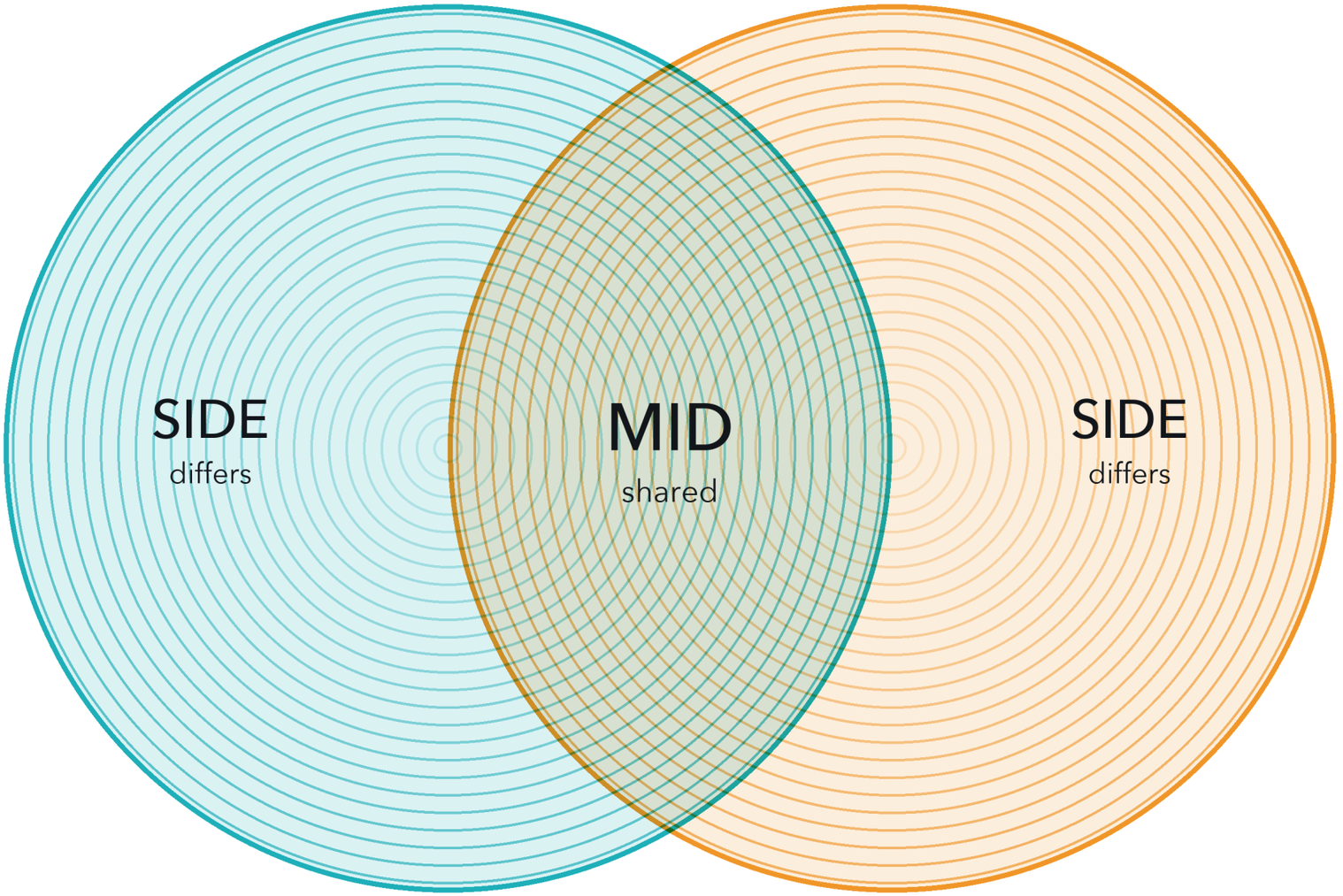
Read any note.

Rest the pointer on the Spectrum and Supernami reads the point under it: frequency, level and the nearest note.

READOUT	Hz, dB and the note, with cents: A2 +3c is 3 cents above A2.
PIANO KEY	The matching key lights, and a line runs from it to the point on the trace.
TRACES	With two traces, the nearest one is read.
PIANO ICON	Switch the strip and the glow on or off.

On the bench

Name a bass note: hover over the peak of its lowest note. The cents show how far that band sits from the note. Bands are about half a semitone wide, so it is a guide, not a tuner.


SIDE
differs
MID
shared
SIDE
differs
LEFT
RIGHT

Two channels, one centre.

Left and right make a stereo picture.

Add them together and you hear the Mid: what is shared between both. Subtract one from the other and you hear the Side: what is different.

A sound identical in both channels is all Mid. A wide sound has more Side.

MID AND SIDE

Centre and sides.

Mid is what the left and right channels share: the centre of the mix. Side is what differs between them: its width.

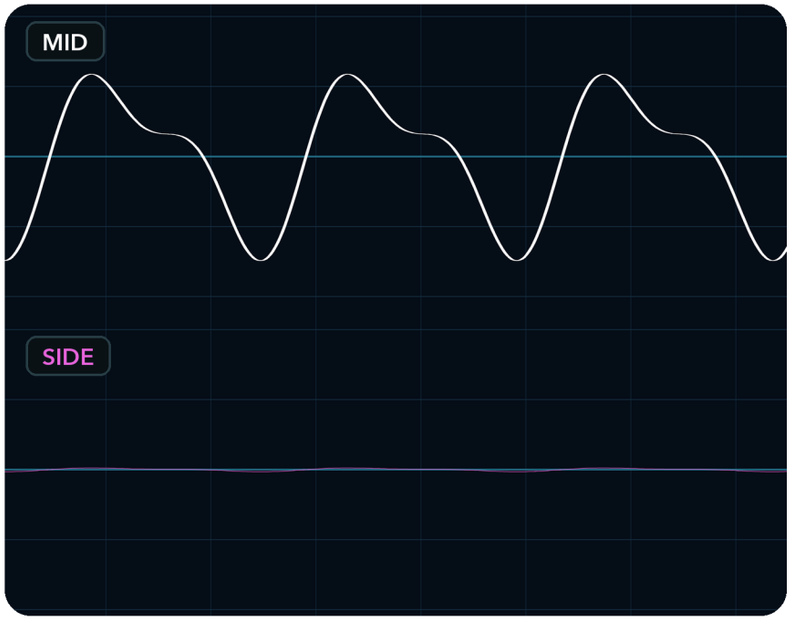
MID	Mid = (L + R) / 2. White.
SIDE	Side = (L - R) / 2. Magenta.
M/S	Both at once, in two panes.
L/R	Left in cyan, Right in orange.
TRIGGER	In a two-pane view, click the legend to choose which wave the Trigger watches.

35

ON THE BENCH

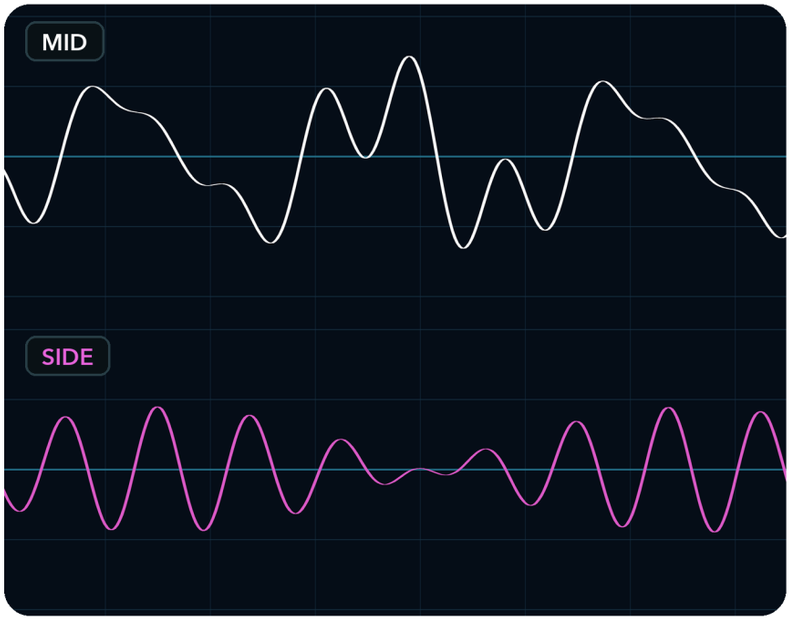
Check how wide a part is

Set Source to M/S. Then watch the magenta Side line.



NARROW

A bass, right in the middle.
Side stays almost flat.

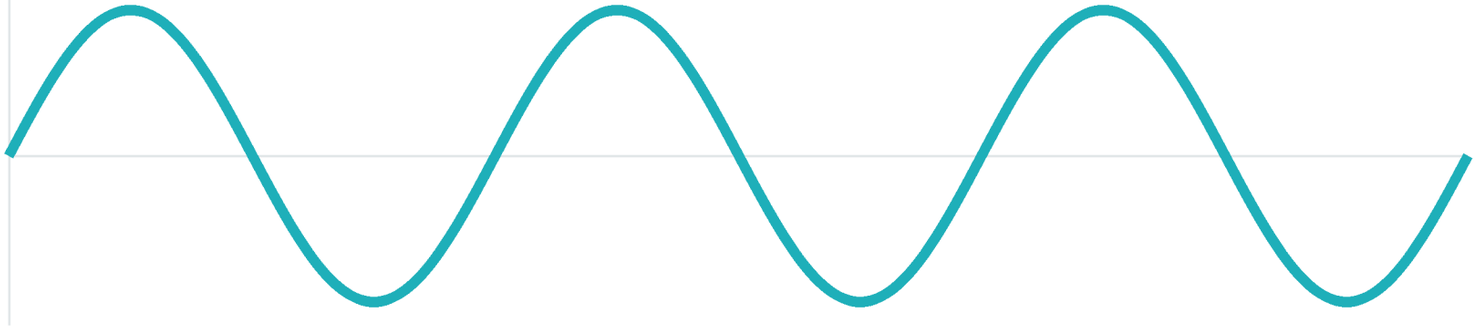


WIDE

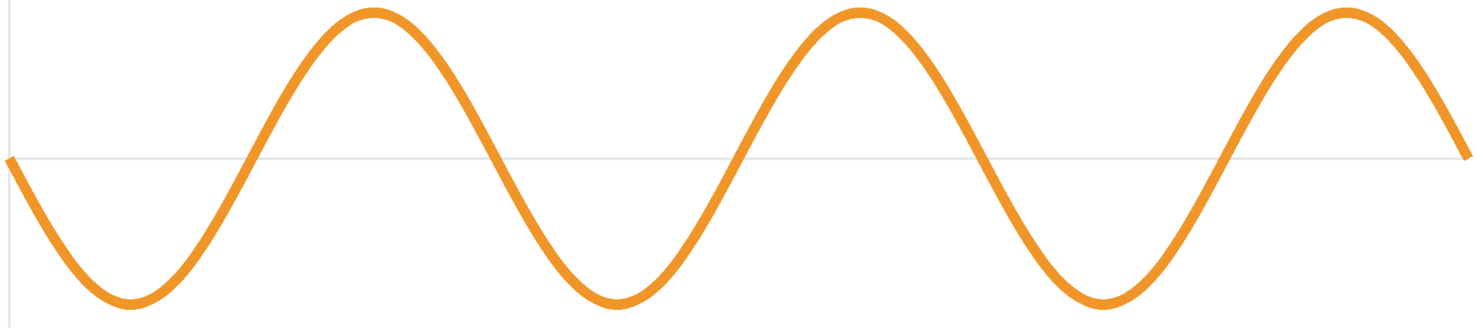
A part spread across the stereo field.
Side becomes more prominent.

Little magenta, narrow.
A lot of magenta, wide.

Left a wave



Right the same wave, upside down



Mono the sum: silence



The sound that disappears.

Two channels can carry the same wave, one of them upside down. Each sounds normal alone.

Add them together, as mono does, and every peak meets a dip. The sum is silence.

In Mid and Side terms the sound is all Side: Mid, (L+R)/2, is zero; Side, (L-R)/2, is the wave.

So width is not just "make it wider". A wide, out-of-phase sound can vanish in mono. Watch the Mid in M/S to see what survives.

Folds away.
Maps to Remote.

INSPECTOR

Every control lives on the display. Open the inspector on the Scope or the Spectrum tab.

SLIM BAR

Fold the inspector down to a slim bar. It remembers whether you left it open.

REMOTE

X Zoom and Y Zoom can be mapped to Remote. They are the two zoom sliders, on the left edge and along the bottom of the display.

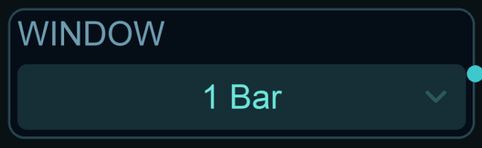
ROUTING

Left and Right inputs and Left and Right thrus, stereo only, on the back panel.
The signal is never altered.



Scope | Spectrum
Switch between the two views.

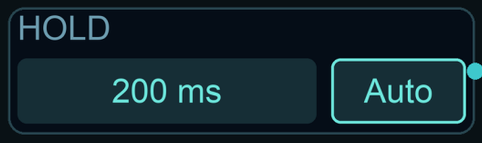




Window
Free, or a musical length locked to your song.

Trigger
Off, Rising or Falling.





Hold and Auto
How long a catch stays. Auto follows the signal.

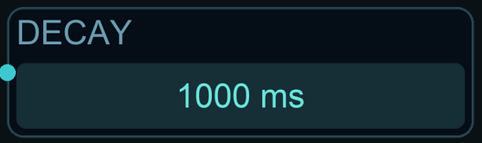
Fallback
Freerun, or Hold/Wait.





Reading
Peak, White or Pink.

Decay
How slowly each band falls.





Piano Roll
Switch the strip and the glow on or off.

The inspector folds down to a slim bar.

TROUBLESHOOTING

When the picture doesn't look right.

No waveform

Source Freeze

Is Source on a channel that has audio, and is audio patched to the Left and Right inputs? Freeze stops the picture.

The picture slides

Trigger Threshold

Turn Trigger on, Rising or Falling, and set the Threshold across the signal.

No triggered catch

Threshold Fallback

The signal must cross the Threshold. Fallback decides what is drawn when nothing does.

No spectrum peaks

Source X Zoom Y Zoom Freeze

Check Source, then zoom back out: the Spectrum shows -80 to +20 dB.

Notes do not line up

Hover

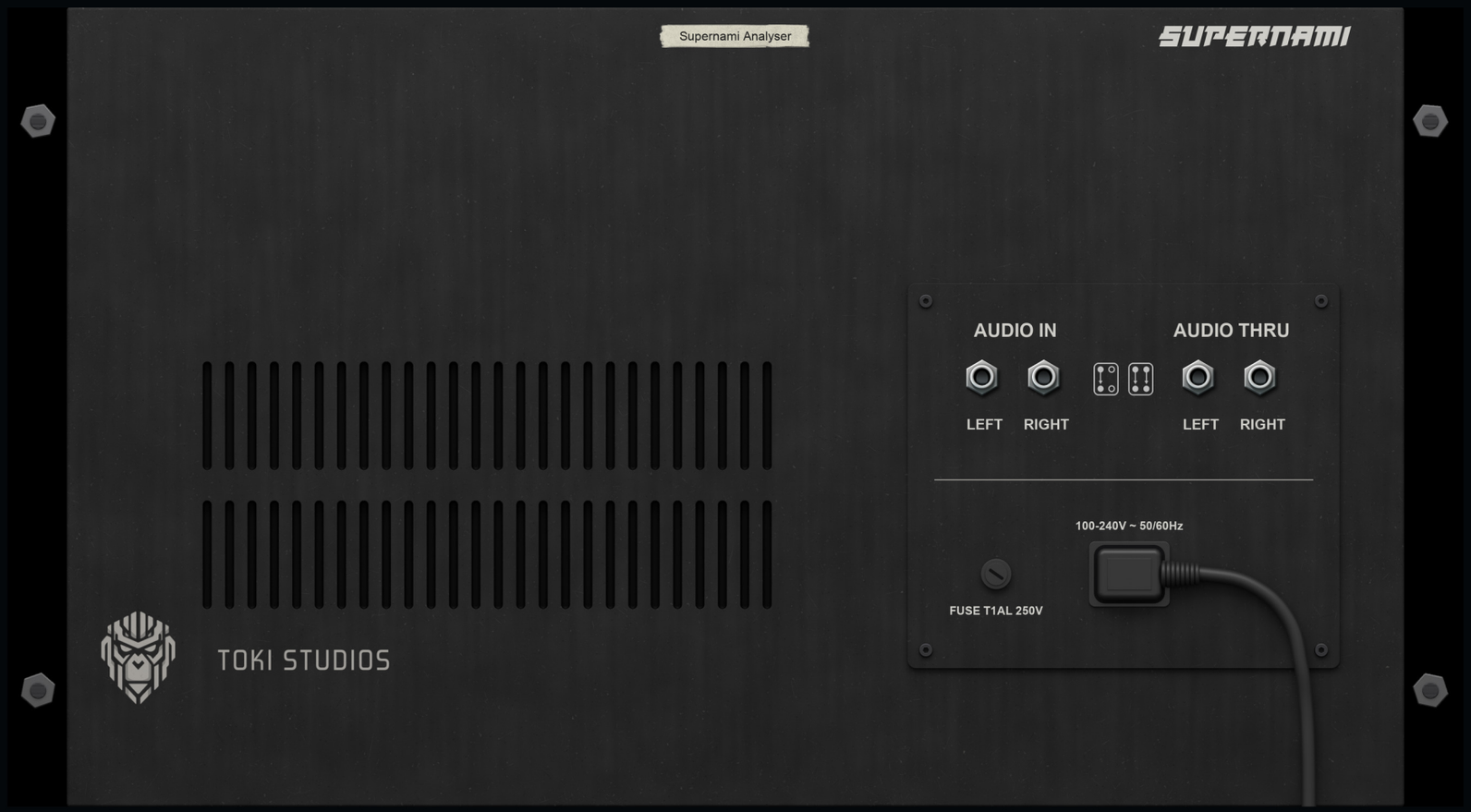
The note readout assumes A = 440 Hz, in 12 equal notes to the octave, with no tuning control. Each band is about 47 cents wide.

GLOSSARY

Sound, in plain words.

Amplitude	The height of a wave: the strength of the signal.
Cent	A hundredth of a semitone. A Spectrum band is about 47 cents wide.
dBFS	Decibels relative to full scale. 0 dBFS is the top of a digital signal.
Decay	How slowly each Spectrum band falls back after a peak.
Frequency	Cycles per second, in hertz (Hz). It sets the pitch.
Fundamental	The lowest tone in a note. It sets the pitch you hear.
Harmonic	A tone above the fundamental, at 2, 3, 4 times its frequency.
Mid	What the left and right channels share: (L+R)/2.
Octave	A doubling of frequency.
Phase	How far through its cycle a wave is. Waves in opposite phase cancel.
Side	What differs between left and right: (L-R)/2.
Threshold	The level the signal must cross to start a Trigger catch.

Look closer.
Listen differently.



TOKI STUDIOS

Supernami Analyser · Operational Manual · Version 1.1