Nestorium User Guide

Binaural beats, frequency exploration, and overtones

In collaboration with Harmonic Sounds® and Remigijus Dzingelevičius

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1 Getting Started

So you've found **Nestorium**! Think of it as your personal frequency playground. Whether you're into meditation, sound design, or just curious about how tones work together—this tool lets you dial in precise frequencies and experiment with binaural audio.

What's the deal with binaural audio?

Here's the cool part: when you play two slightly different frequencies in each ear (left vs right), your brain basically does some math and perceives a third "phantom" tone. That's the binaural beat. The difference between the two frequencies determines what you hear. With Nestorium, you control both sides completely—no presets forcing you into specific frequencies.

> ⚠️ **Important:** Seriously—use headphones. Without them, you're just hearing two tones, not the binaural effect. Also keep the volume reasonable, these are sustained tones and can get fatiguing if too loud.

Full application overview showing the main interface

2 Transport Controls

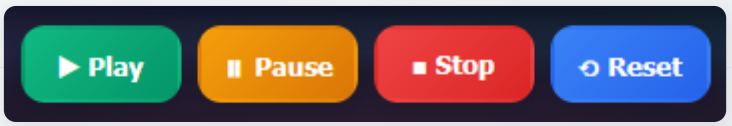
Pretty straightforward here—these buttons at the top work like any media player you've used:

The Controls:

- ▶ **Play** - Hit this to start the audio based on whatever you've got the wheels set to
- ⏸ **Pause** - Pauses things but keeps your settings (you can resume right where you left off)
- ■ **Stop** - Full stop, kills the audio
- ⟲ **Reset** - Wipes everything back to defaults if you've gotten lost tweaking

Basic workflow:

1. Dial in your frequencies on both wheels
2. Hit **Play**
3. Tweak settings while it's playing—you'll hear changes immediately
4. **Pause** to stop temporarily, **Stop** to kill it completely



Transport controls (Play, Pause, Stop, Reset buttons)

3 Binaural Twin Wheels

These big spinning wheels are where the magic happens. Left wheel = left ear, right wheel = right ear (though you can change this with pan controls if you want). Each wheel has TWO pointers—one for coarse adjustments, one for fine tuning.

Left Wheel & Right Wheel

By default, left controls your left ear, right controls your right ear. Simple enough. But here's what's neat—you've got dual pointer control on each wheel for different levels of precision.

Big Pointer (the outer one)

This is your main frequency selector—grab it and drag around the wheel to jump between frequencies. The numbers around the edge are your reference points. It smoothly interpolates between them as you move.

- Use this for: Big jumps, getting into the ballpark of the frequency you want
- Clockwise = higher frequency, counter-clockwise = lower
- It covers the full range, just keep spinning

Small Pointer (inner circle)

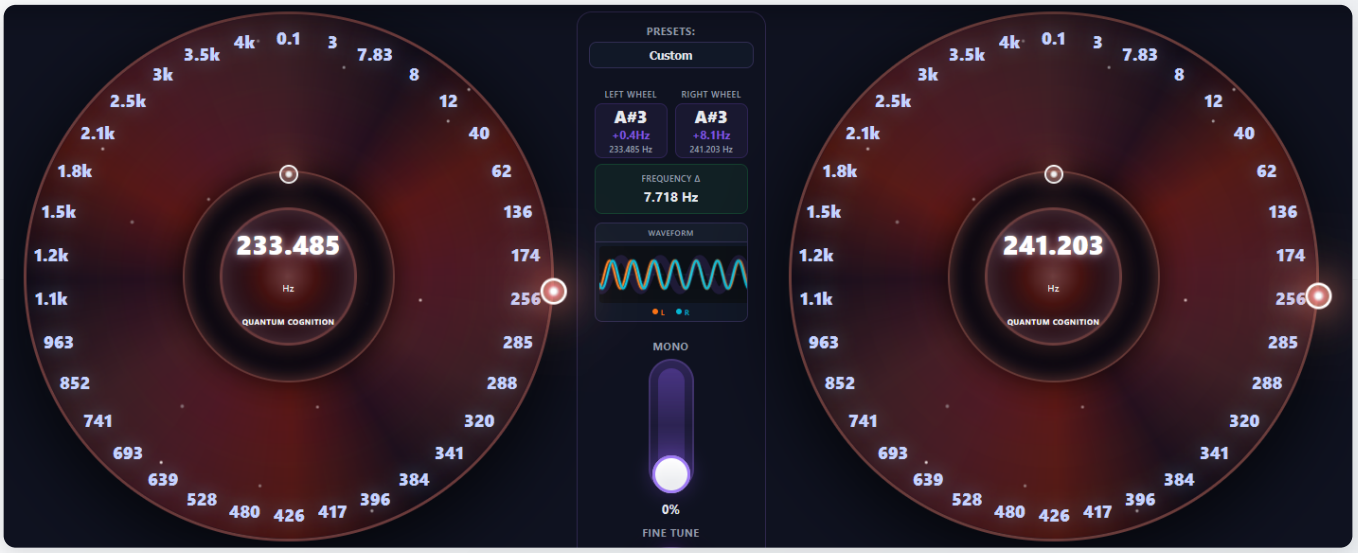
Okay, this is where you can get ridiculously precise. The inner pointer lets you dial in frequencies to **0.001 Hz**. One full rotation only changes the frequency by 0.1 Hz—so yeah, you can really nail exact values.

- Use this for: Getting that perfect binaural beat interval, matching exact frequencies
- Super sensitive—one full spin = just 0.1 Hz change
- Clockwise adds tiny amounts, counter-clockwise subtracts

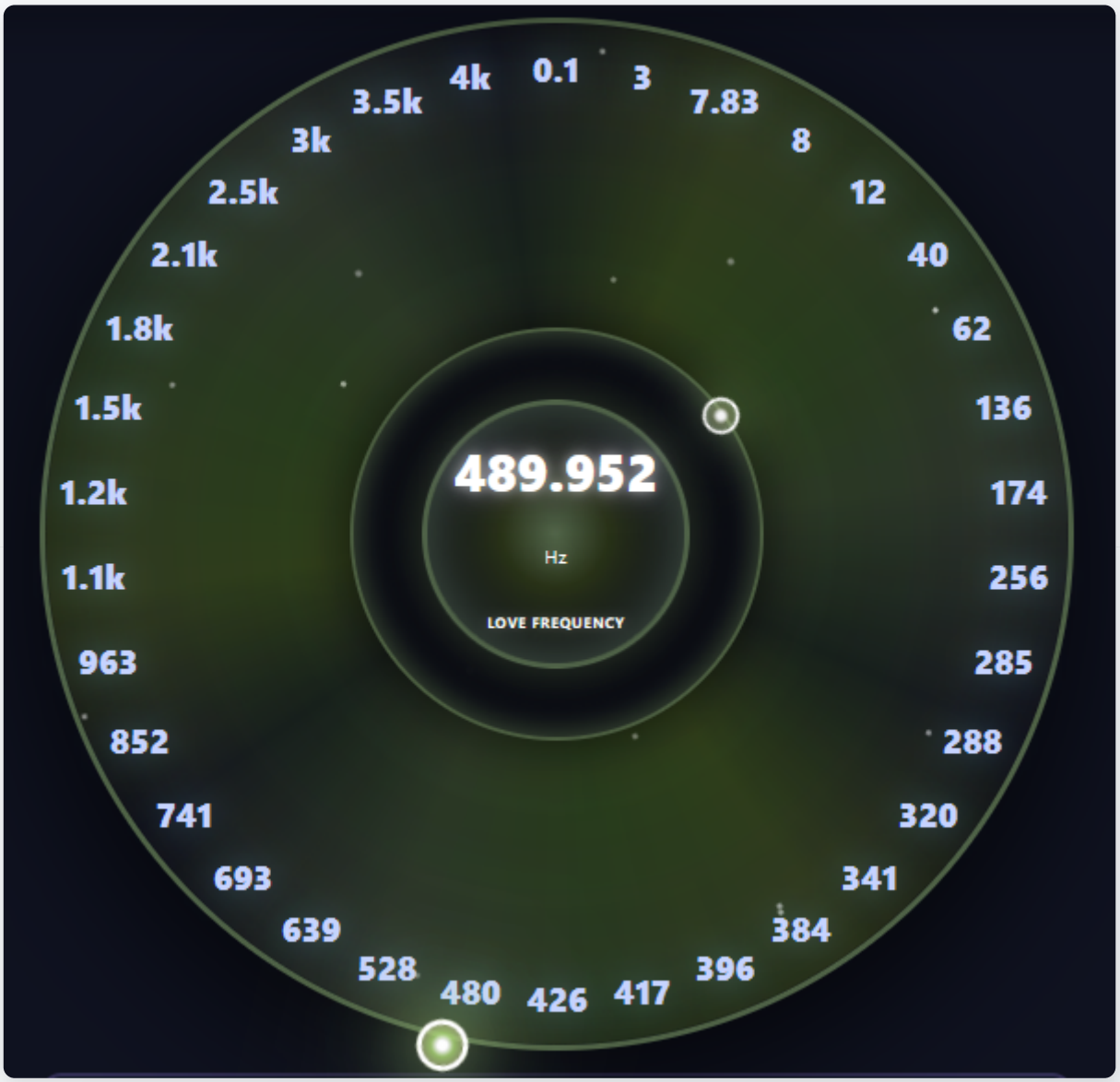
Using the wheels:

1. Start with the **big pointer**—drag it around to get close to your target frequency
2. Then use the **small inner pointer** to fine-tune it down to the exact Hz
3. The center of each wheel shows your current frequency with three decimal places
4. Check the center panel for musical note info and the frequency difference between both wheels

> 💡 **Tip:** For binaural beats that you can really feel, keep the difference between your two wheels in the 1-40 Hz range. The inner pointer is perfect for dialing this in precisely.



Both wheels side by side showing the wheel interface



Close-up of a single wheel showing the big outer pointer and small inner pointer

4 Pan Controls

Each wheel has a pan slider so you can move the sound left, right, or center in your stereo field.

How panning works:

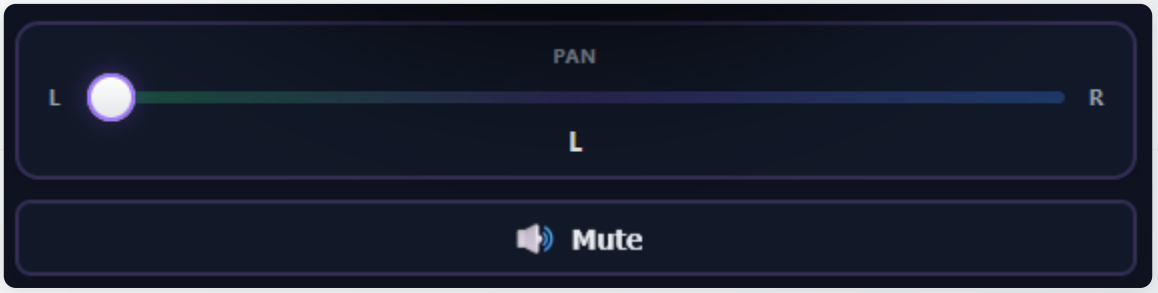
- **L** - sound comes out the left side only
- **Center** - sound plays equally in both ears
- **R** - sound comes out the right side only

Out of the box, left wheel goes to left ear, right wheel to right ear—standard binaural setup. But you can mess with this if you want to experiment.

How to Use:

1. Locate the pan slider below each wheel
2. Drag the slider left or right to adjust panning
3. The current pan position is displayed below the slider

> 💡 **Tip:** Want to hear something weird? Center both pans and listen to the frequencies interact—you'll hear interference patterns instead of a binaural beat.



Pan controls showing the L-R slider and current value display

5 Mute Controls

Each wheel has a dedicated mute button that allows you to silence that channel without changing any settings.

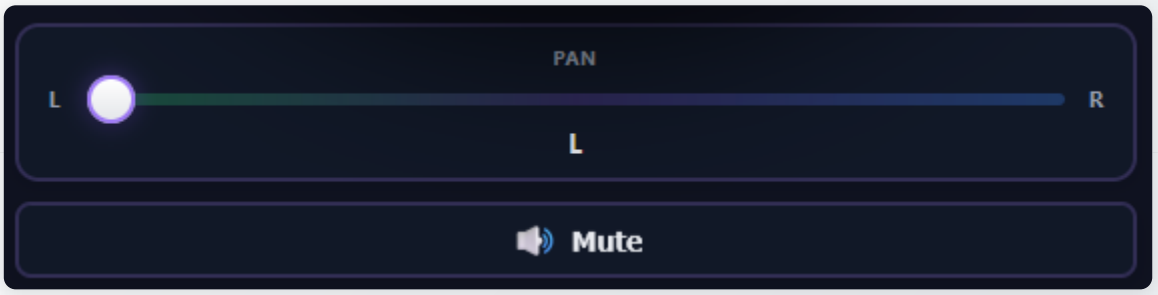
Mute Button States:

- 🔊 **(Speaker icon)** - Audio is active
- 🔇 **(Muted icon)** - Audio is muted

How to Use:

1. Click the **Mute** button below a wheel to toggle its audio
2. The icon will change to indicate the current state
3. Click again to unmute and restore audio

> 💡 **Tip:** Mute one side to hear just that frequency by itself. Useful when you're dialing things in and want to focus on one tone at a time.



Mute button in both states (unmuted and muted)

6 Preset Intervals

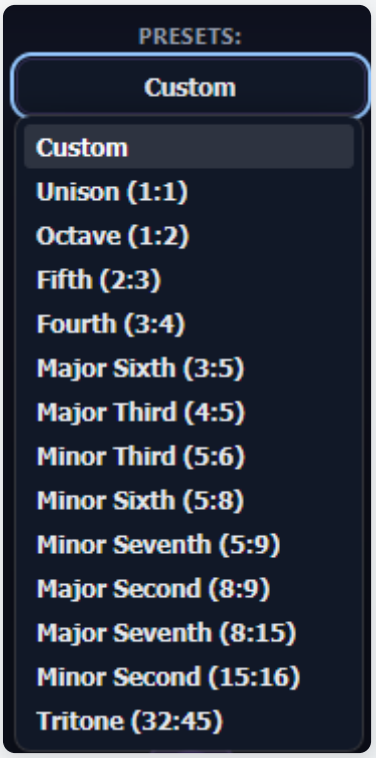
Don't want to figure out frequency ratios yourself? Hit the presets dropdown. These are classic musical intervals with mathematically perfect ratios.

Available Presets:

- **Unison (1:1)** - Both wheels at the same frequency
- **Octave (1:2)** - Second wheel is double the first
- **Fifth (2:3)** - The perfect fifth interval
- **Fourth (3:4)** - The perfect fourth interval
- **Major Sixth (3:5)** - Major sixth harmony
- **Major Third (4:5)** - Major third harmony
- **Minor Third (5:6)** - Minor third harmony
- **Minor Sixth (5:8)** - Minor sixth harmony
- **Minor Seventh (5:9)** - Minor seventh interval
- **Major Second (8:9)** - Major second interval
- **Major Seventh (8:15)** - Major seventh interval
- **Minor Second (15:16)** - Minor second (semitone)
- **Tritone (32:45)** - The tritone interval

Using presets:

1. Open the **Presets** dropdown
2. Pick an interval
3. Both wheels snap to the right ratio automatically
4. As soon as you touch a wheel, it'll say "Custom" again



Presets dropdown menu showing all available options

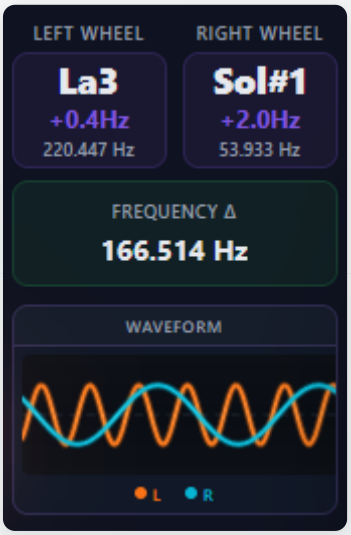
7 Live Information Display

The center panel gives you the technical readout of what's actually playing. Numbers don't lie.

What you're seeing:

- **Note names** for both wheels—closest musical note to your frequency
- **Offset in cents**—tells you how sharp or flat you are from that note
- **Exact frequency** in Hz for each wheel
- **Frequency Δ (Delta)** - this is the big one: the difference between your two frequencies

> 💡 **Tip:** That Delta number? That's your binaural beat frequency. If it says 10 Hz, your brain is processing a 10 Hz beat between the two tones.



Live information display showing note names, offsets, frequencies, and delta

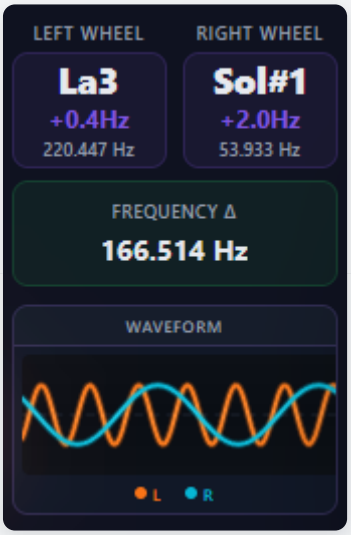
8 Waveform Visualization

The little waveform display shows you what's happening visually—both channels in different colors.

What you're looking at:

- **L** = left channel (one color)
- **R** = right channel (different color)
- Updates in real-time while audio plays

It's mostly just eye candy, but it does help you see how the two frequencies relate to each other and interact.



Waveform visualization showing both left and right channels

9 Mono Volume Control

Mono control mixes both frequencies together into the center of your stereo field.

Why use it?

At 0%, you get pure left/right separation (classic binaural). Crank it up and you'll blend both tones into the center, which can make the beat more pronounced or just give you a thicker sound overall.

How to Use:

1. Locate the **Mono** slider in the center control panel
2. Drag the slider up to increase the mono mix (0-100%)
3. The percentage is displayed next to the slider

> 💡 **Tip:** I usually start at 0% for pure stereo separation, then nudge it up if I want more body to the sound. Totally a taste thing.

Mono volume slider and percentage display

10 Fine Tune Dial

This little dial shifts BOTH wheels by the same amount—handy when you want to transpose everything without changing the relationship between the two tones.

What it does:

- Moves both frequencies together (keeps the delta the same)
- Shows the shift amount in Hz
- Good for micro-tuning the whole thing up or down

How to Use:

1. Locate the **Fine Tune** dial in the center panel
2. Click and drag the dial to rotate it
3. The current offset value is shown in Hz
4. Both wheels shift by this amount while maintaining their relationship

Fine Tune dial showing the rotary control and Hz display

1️⃣1️⃣ Light/Dark Mode

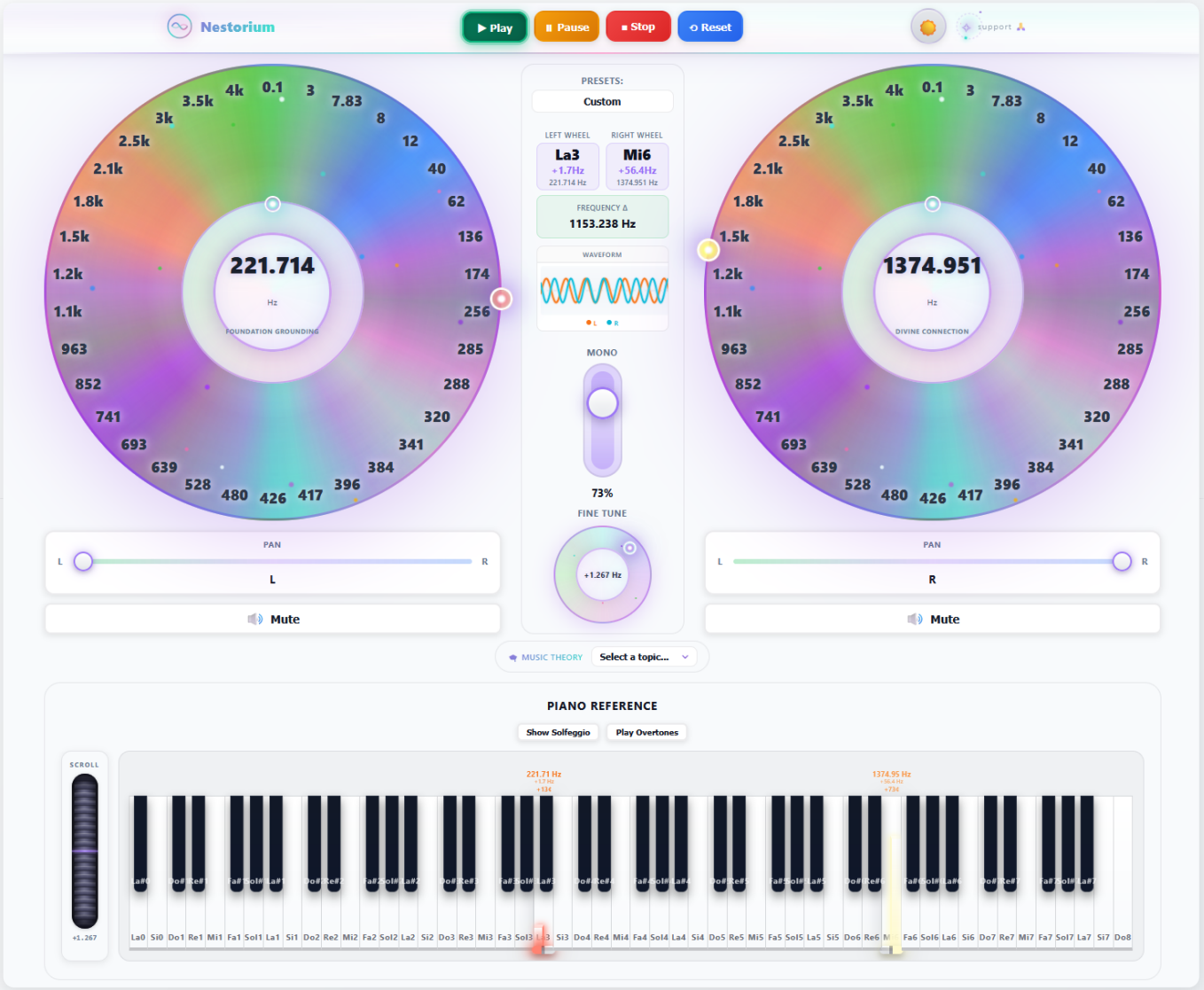
Light mode burning your eyes at 2am? Hit the theme toggle.

Your options:

- 🌞 **Light Mode** - bright, daytime-friendly
- 🌙 **Dark Mode** - easy on the eyes when it's dark

Switching themes:

1. Look for the 🌞 / 🌙 button in the top-right
2. Click it to toggle
3. It'll remember your choice next time



Application in Light Mode

Application in Dark Mode

12 Music Theory Section

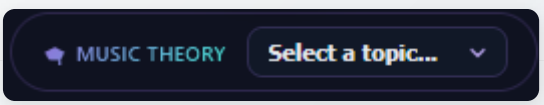
There's a little 🎓 Music Theory dropdown that explains sound concepts if you're curious about the science behind what you're hearing.

Available Topics:

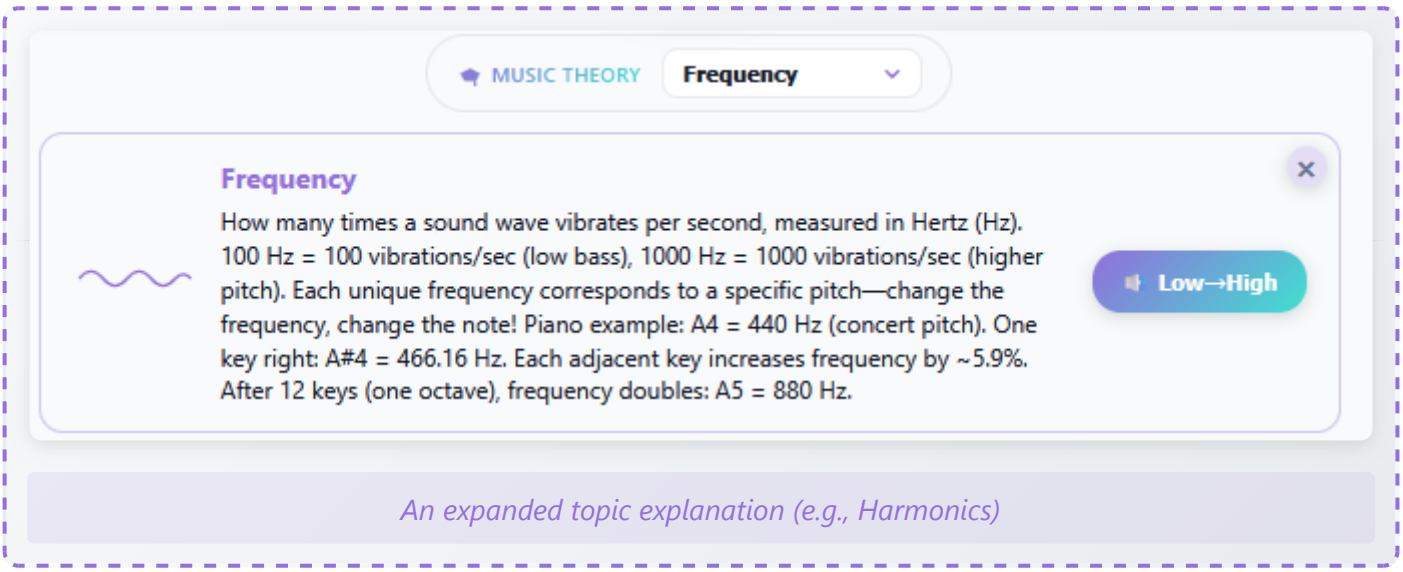
- **Frequency** - Understanding Hz and sound waves
- **Vibrations** - How sound is created
- **Harmonics** - The mathematics of musical harmony
- **Overtones** - Natural frequencies above the fundamental
- **Timbre** - What makes instruments sound different
- **Tone** - Pure vs. complex tones
- **Note** - Musical note naming conventions
- **Scale** - How notes organize into scales
- **Octave** - The 2:1 frequency relationship

How to Use:

1. Locate the 🎓 **Music Theory** section
2. Click the dropdown menu to select a topic
3. Read the explanation that appears
4. Some topics include interactive demonstrations
5. Click the × button to close the explanation



Music Theory dropdown with topic selection



An expanded topic explanation (e.g., Harmonics)

13 Piano Reference Keyboard

The piano keyboard is there to help you visualize where your frequencies land in musical terms.

What it does:

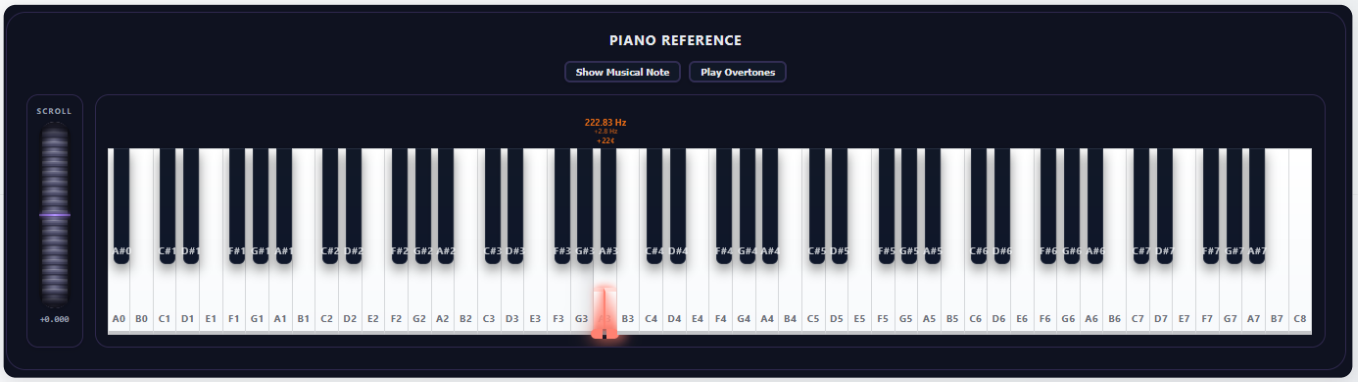
- Click keys to play specific notes
- Highlights whatever frequencies your wheels are set to
- Can show overtone relationships if you toggle that on

Toggle Options:

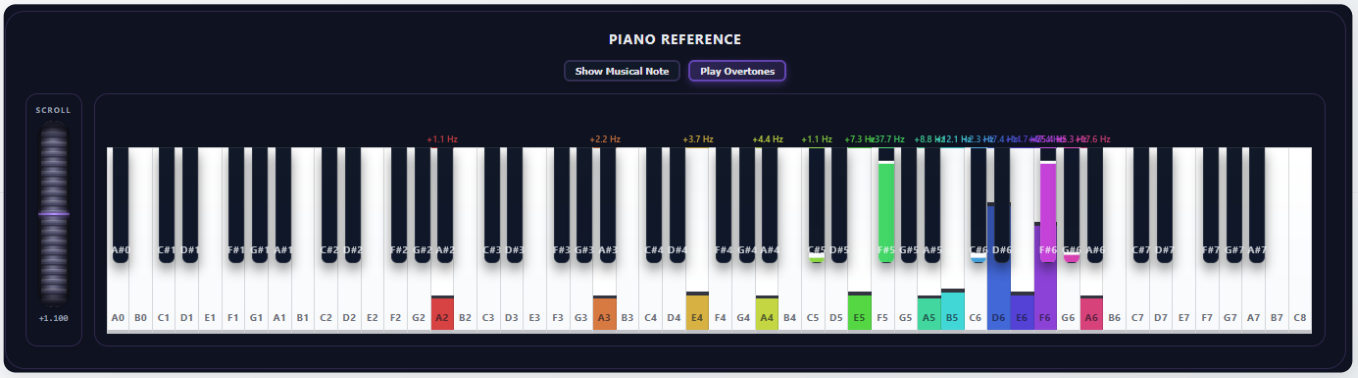
- **Show Musical Note** - Displays note names on the keys
- **Play Overtones** - Highlights harmonic overtones on the keyboard

How to Use:

1. Scroll down to the **Piano Reference** section
2. Click keys to hear their frequency
3. Toggle **Show Musical Note** to see note labels
4. Toggle **Play Overtones** to visualize harmonic relationships



Piano keyboard with note labels enabled



Piano keyboard with overtone highlights active

14 Pitch Bend Wheel

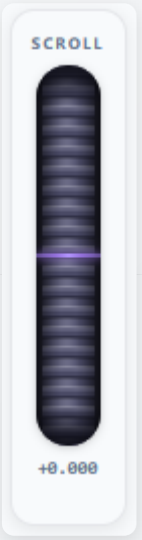
That "Scroll" wheel next to the piano? That's your pitch bend control—drag it to bend notes up or down.

How it works:

- It's right beside the piano keyboard
- Drag up to raise pitch, down to lower it
- Shows you the bend amount in Hz
- Let go and it snaps back to center

How to Use:

1. Locate the **Scroll** wheel beside the piano
2. Click and drag up to raise pitch
3. Click and drag down to lower pitch
4. Release to return to normal pitch
5. Watch the value display for precise control



Pitch Bend wheel showing the scroll control and value display

15 Overtones Display

Overtones section is where things get interesting. Pick a fundamental frequency and it'll show you the entire harmonic series built on top of it.

What are overtones anyway?

Whenever you hear a musical note, you're not just hearing one frequency—you're hearing a whole stack of higher frequencies at mathematical intervals (2x, 3x, 4x the fundamental, etc.). These overtones are what make a guitar sound different from a piano even when playing the same note.

Control Options:

- **Harmonic Only** - Plays only consonant harmonics (Fundamental, Octaves, Fifths, Thirds)
- 🔁 **Replay** - Replays the harmonic sequence from the fundamental
- **Dissonant Only** - Plays only dissonant harmonics (2nds, 4ths, 6ths, 7ths)

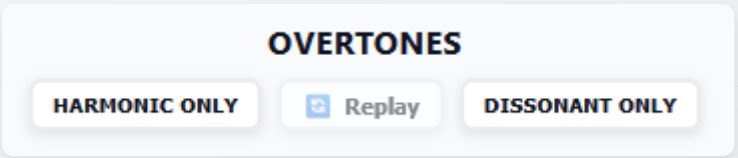
Overtone Cards:

Each overtone is displayed as a card showing its harmonic number, frequency, and musical relationship to the fundamental.

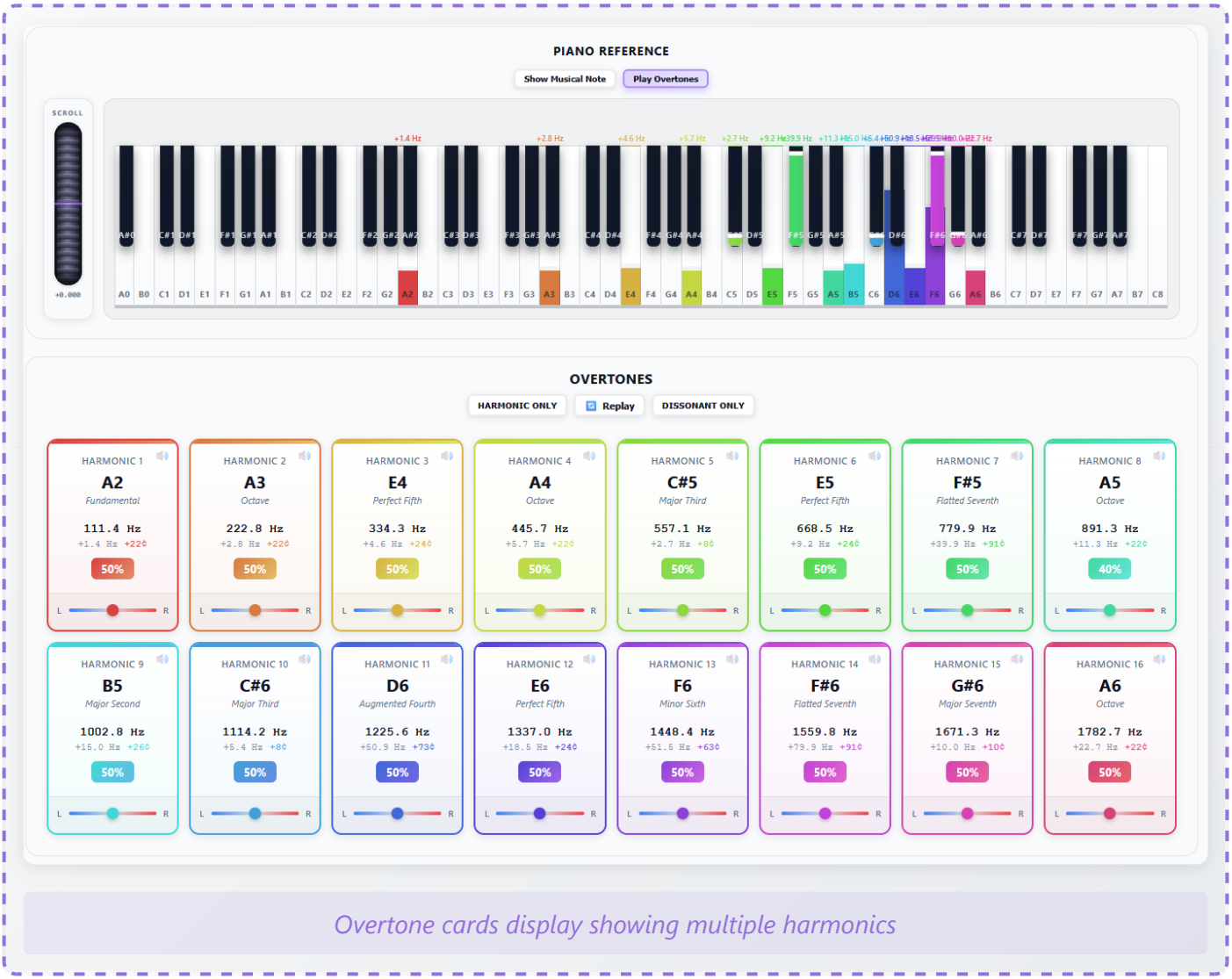
Playing with overtones:

1. Scroll to the **Overtones** section
2. Set a fundamental frequency on the wheels
3. Check out the overtone cards that show up
4. Click any card to hear that harmonic
5. Use **Harmonic Only** or **Dissonant Only** to filter
6. Hit **Replay** to hear them all in sequence

> 💡 **Tip:** This is actually super useful for understanding why some intervals sound "nice" (consonant) and others sound "tense" (dissonant). It's all about how the overtones line up—or don't.



Overtones section showing the header controls (Harmonic Only, Replay, Dissonant Only)



Overtone cards display showing multiple harmonics

16 Overtone Singing Practice

This feature transforms Nestorium into a powerful tool for learning overtone singing. You can use the piano keyboard to find your comfortable natural tone and practice isolating individual overtones by listening to them one at a time. For mobile practice, check out the Overtone Singer app.

What is Overtone Singing?

Overtone singing (also called throat singing or harmonic singing) is a vocal technique where you sing one fundamental note with your voice, then manipulate your vocal tract to amplify specific overtones above that fundamental. The result? You can produce two or more distinct pitches simultaneously—a low drone and a clear, flute-like melody on top.

How the Practice Feature Works:

Step 1: Find Your Comfortable Fundamental

1. Click any key on the piano keyboard to find a note you can comfortably drone/hum
2. Everyone's voice is different—play keys until you find one that feels natural and sustainable
3. This becomes your fundamental frequency for overtone practice

Step 2: Overtones Display on Keyboard

1. Once you select your fundamental, the keyboard automatically highlights where each overtone appears
2. The overtone series is visually displayed on the piano keys
3. Each harmonic (2nd, 3rd, 4th, 5th, etc.) is clearly marked

4. You see the exact frequency and musical interval for each overtone

Step 3: Solo Mute Controls

1. **Mute All Except One:** Click any overtone to hear ONLY that specific harmonic
2. All other overtones are muted automatically
3. This lets you focus on one overtone at a time without distraction
4. Listen to the isolated overtone, memorize its sound

Step 4: Practice Each Overtone

1. Start with the 2nd harmonic (octave)—easiest to hear and match
2. Play it isolated, listen carefully to the pitch
3. Try to sing/drone your fundamental while matching that overtone with your voice
4. Move to the next overtone when ready
5. Work your way up through the harmonic series: 3rd, 4th, 5th, 6th...

Key Features of the Practice Mode:

- **Visual Overtone Map:** See exactly where each harmonic sits on the keyboard
- **Solo/Mute Control:** Isolate any single overtone to practice it in isolation
- **Sequential Practice:** Step through overtones one by one
- **Custom Fundamental:** Choose ANY note that's comfortable for YOUR voice
- **Frequency Display:** See the exact Hz value for each overtone
- **Harmonic Number Labels:** Know which overtone you're hearing (2nd, 3rd, 4th, etc.)

Why This Approach Works:

Learning overtone singing is all about training your ear to recognize these specific frequencies. By isolating and playing each overtone individually:

- You learn what each harmonic sounds like in isolation
- You can compare the reference tone to what you're producing with your voice
- You're not overwhelmed by hearing all the overtones at once
- You build muscle memory for isolating each overtone vocally

> 💡 **Tip:** Start with lower harmonics (2nd and 3rd) as they're the loudest and easiest to isolate. Once you can produce those consistently, higher harmonics become accessible. Practice with headphones so you can clearly hear both the reference tone and your own voice.

> ⚠️ **Important:** Don't strain your voice! Overtone singing should feel effortless once you find the right technique. If it hurts or feels uncomfortable, take a break. Stay hydrated and practice in short sessions.

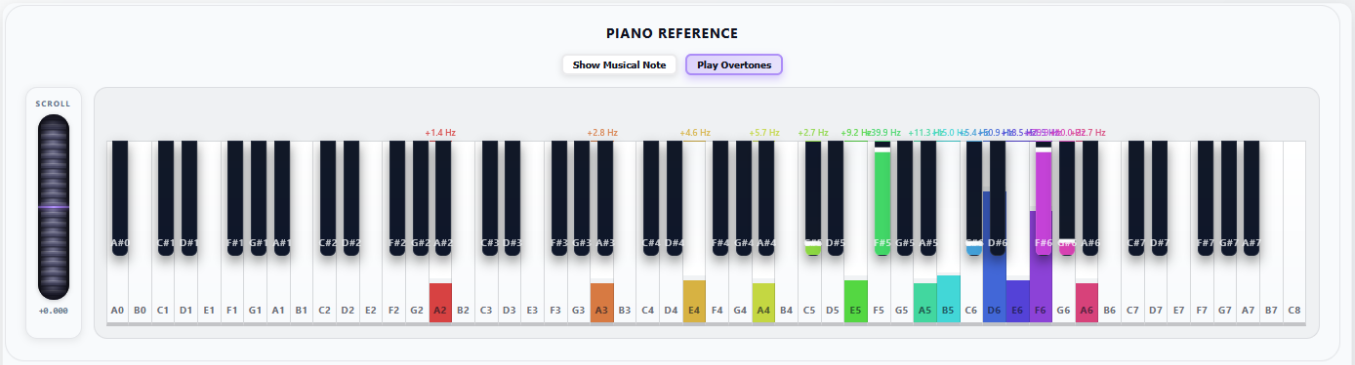
Example Practice Session:

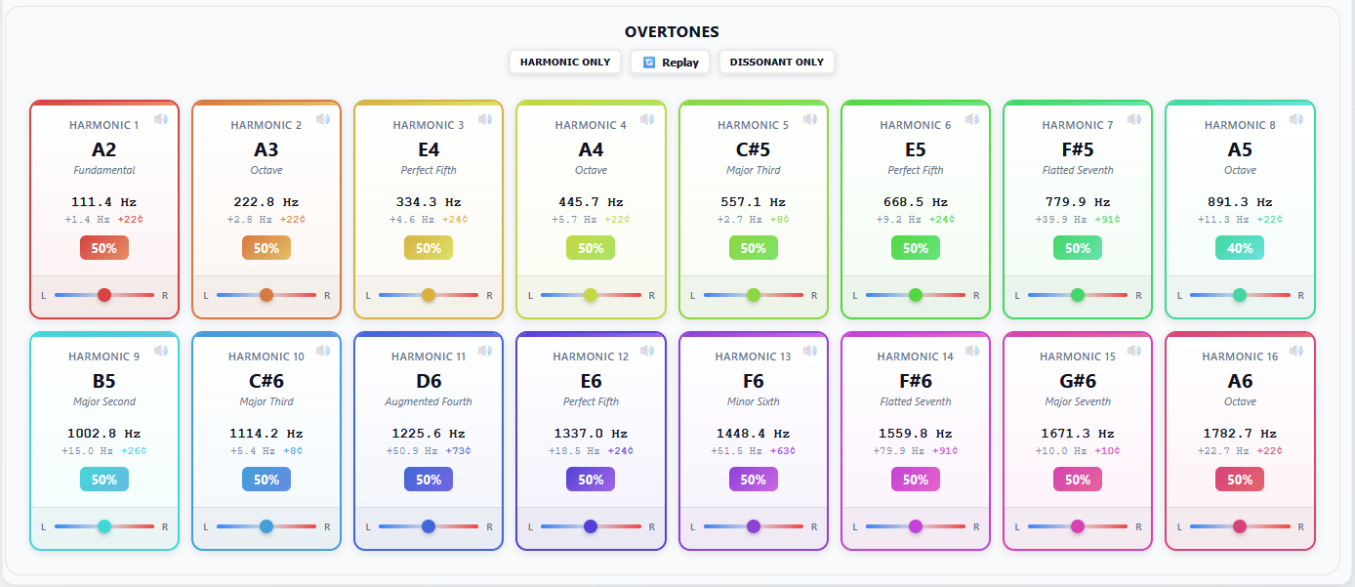
1. Play piano keys and find a comfortable fundamental (e.g., E2 at 82.4 Hz)
2. Keyboard displays all overtones visually on the keys
3. Click the 2nd harmonic key—all other overtones mute
4. Listen to that isolated overtone (E3 at 164.8 Hz)
5. Sing your E2 fundamental and try to amplify that E3 overtone with your vocal tract
6. When comfortable, click the 3rd harmonic and repeat
7. Continue through the series at your own pace

Want Professional Training?

For comprehensive instruction in overtone singing, check out the **Harmonic Sounds®** overtone singing course:

Click to visit the Harmonic Sounds® Overtone Singing Course





Overtone cards display showing multiple harmonics for singing practice

17 Support & Donations

Like Nestorium? There's a donation link if you want to throw a few bucks the developer's way.

How it works:

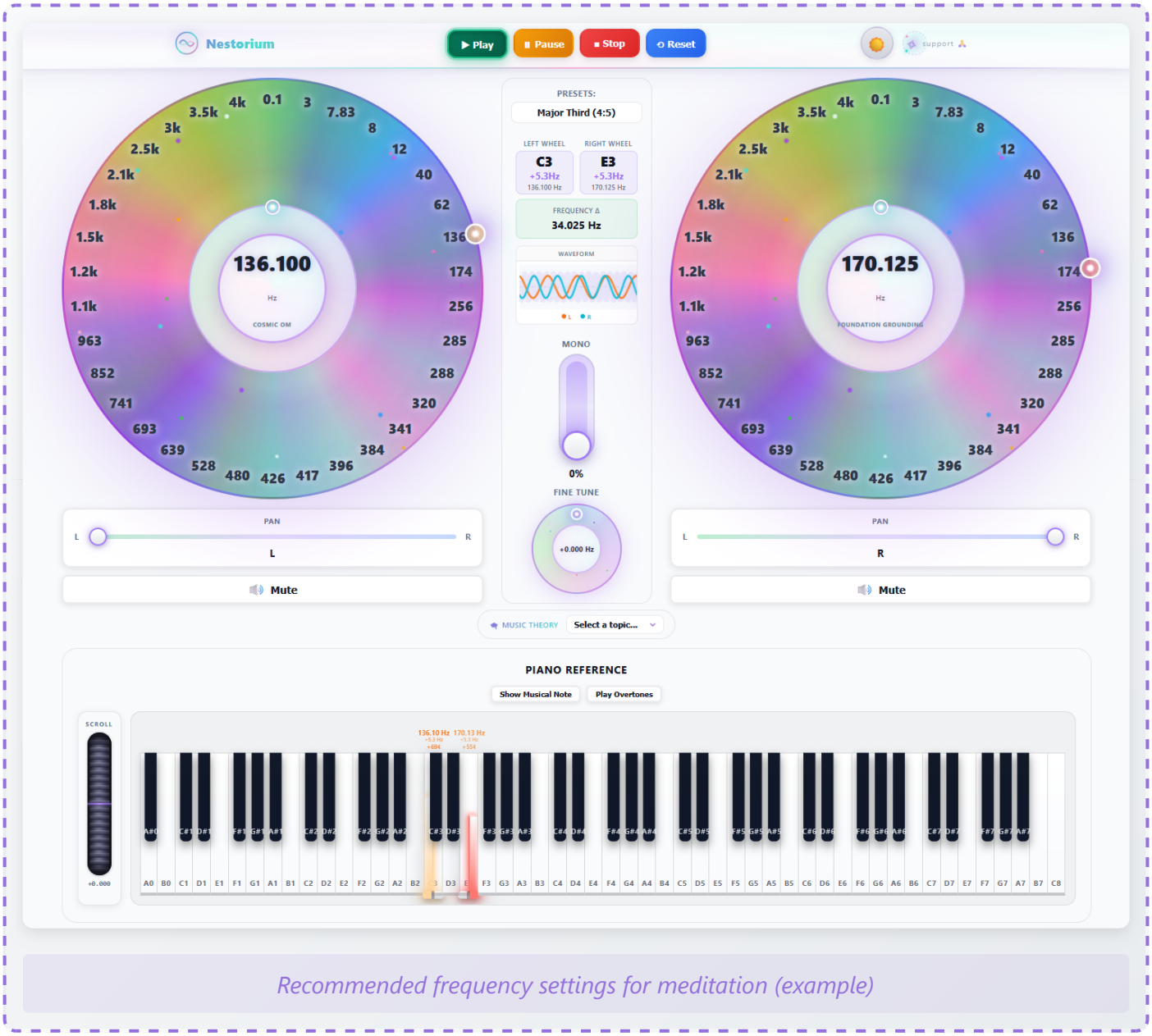
- Click the ✧ **support** 🙏 button up top
- Goes straight to PayPal
- Any amount helps keep the project going

Support/donate button location in the header

📋 Quick Reference

Tips & Brainwave Ranges

- Headphones = mandatory for binaural effects
- Low volume is plenty—these beats work best when they're subtle
- Sweet spot for noticeable beats: 1-40 Hz difference between wheels
- **Delta** (0.5-4 Hz) - deep sleep, unconscious
- **Theta** (4-8 Hz) - meditation, creativity, hypnagogic state
- **Alpha** (8-14 Hz) - relaxed but alert, calm focus
- **Beta** (14-30 Hz) - normal waking consciousness, concentration
- **Gamma** (30-100 Hz) - peak focus, processing, insight



Recommended frequency settings for meditation (example)

Nestorium - Frequency Explorer & Binaural Tone Generator

Guide v1.0

Remember: headphones + reasonable volume = best results

💝 If you find Nestorium valuable, please consider supporting its development!

☕ **Support via PayPal**

Try it online: nestorlab.app

Also check out: overtonesinger.com

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