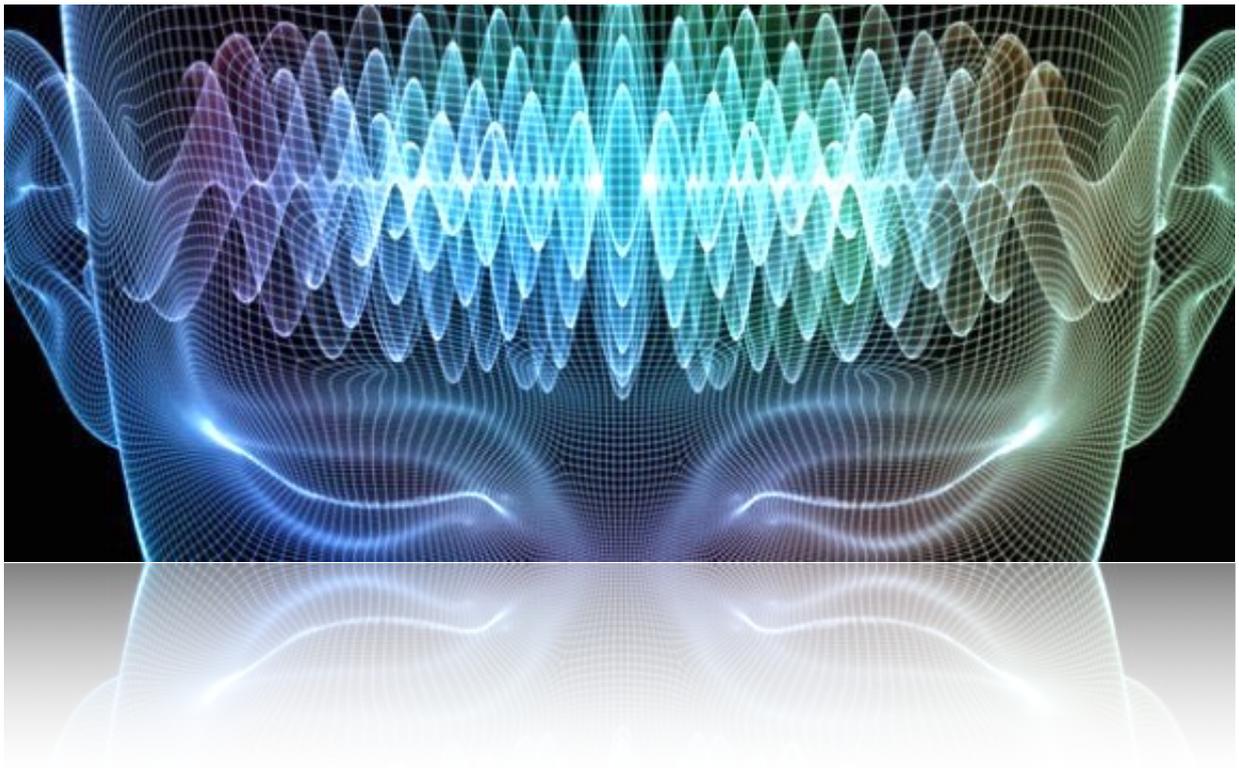




A Beginner's Guide to Binaural Beats



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3rd Edition

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1.

How Binaural Beats Work

A Short History

Heinrich Wilhelm Dove, a German physicist and meteorologist, first discovered binaural beats in 1839.

Dove helped launch the science of global climate study, and wrote over 300 papers in his career.

He was a keen experimenter too, and it was one of his experiments that would pave the way for exploration in the field of brainwave entrainment.

Dove discovered that illusory “beats” are perceived when pure tones of slightly different frequency are separately and simultaneously presented to each ear.

In simplified terms: when the brain simultaneously hears two tones of different frequencies, one sent to the right ear and one to the left ear, it causes the brain to perceive a new tone (a binaural beat).

This tone (beat) is the mathematical difference between the two frequencies sent to the left and right ears. Dove wasn't aware of this mathematical difference at the time.

Dove's key insight was to realize that for this process to occur, the perceived tone (beats) must exist solely within the auditory (hearing) system, specifically the part which processes binaural (e.g., stereo) sound.

Of course, headphones weren't available in those days, so Dove did the following. He had someone stand in a room. On one side of the room he placed a tuning fork. The fork was connected to a tube that ran to the person's ear. He then placed a tuning fork on the other side of the room and ran a tube to the other ear.

The forks didn't vibrate at quite the same low frequency, so the subject received different frequencies to the right and left ears.

Dove documented that his subject perceived the effect of the two frequencies combining as a slow beat. We now know this to be a binaural beat.



The theory would remain nothing more than a curiosity until 1973, when Dr Gerald Oster, a biophysicist, presented a paper in the *Scientific American* (Auditory Beats In The Brain) that sparked further interest and research into brainwave entrainment.

Oster's paper tied-together the different aspects of research that had taken place since Dove's discovery. He gave the subject renewed relevance to modern scientific questions regarding how sound might aid impairments.

Oster viewed binaural beats as having both research value and as a potential diagnostic medical tool.

In terms of research, he saw the potential for binaural beats to explain features of the auditory system, not least how we locate sounds spatially in our environment and selectively single-out individual sounds from background noise.

From a medical perspective, Oster saw potential to not only diagnose auditory impairments, but to identify a range of seemingly unrelated medical issues.

For example: Oster found strong data that suggested diminished ability to hear binaural beats was an early predictor for Parkinson's Disease. He also found that variation in the ability to perceive binaural beats correlated subtly with when subjects were in hormonal cycles.

He found that suggested people with certain neurological conditions, or at certain times of the month (women), vary in their ability to perceive and respond to binaural beats.

But central to his thesis, and indeed what sparked renewed interest and research into how binaural beats can help with focus, anxiety, sleep, pain and memory, etc., was that

binaural beats involve different neural pathways than conventional hearing, and that listening evokes specific neural responses – even when both frequencies (those sent to the left and right ears) are below the human hearing threshold.

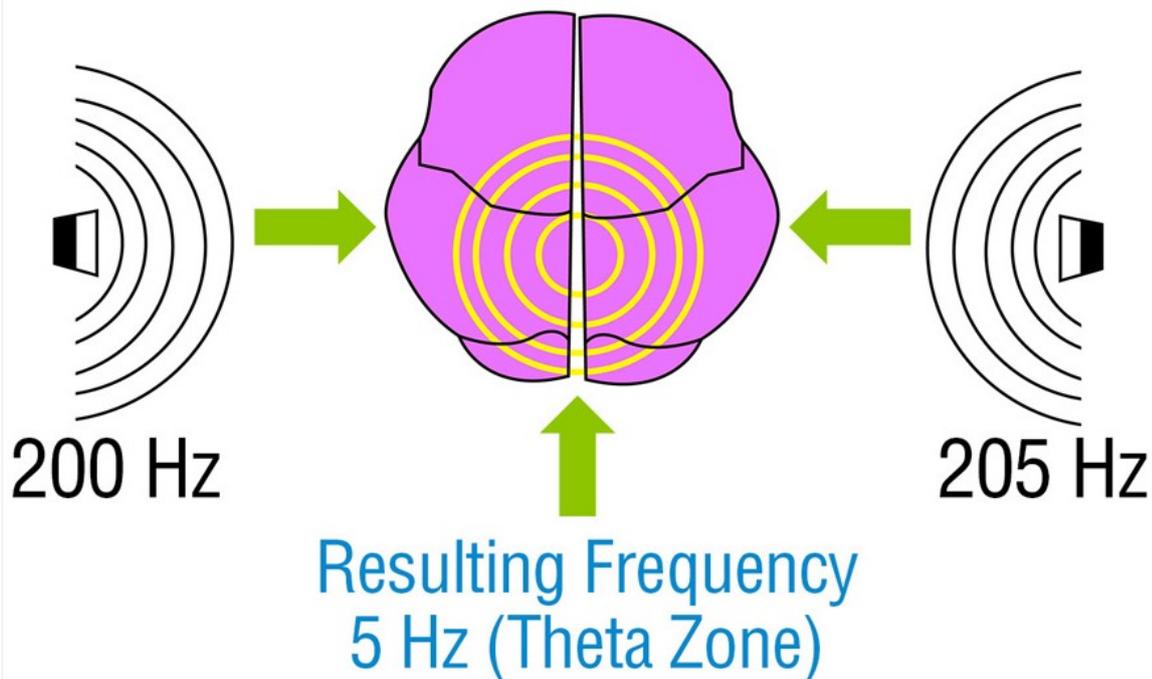
The Frequency Following Response (FFR)

The science of binaural beats occurs naturally in the brain. A different sound (tone) frequency is sent to the left and right ears through headphones.

Upon hearing the two different frequencies, the brain responds by interpreting the two different frequencies as one consistent, rhythmic sound frequency, known as a binaural beat(s).

The resulting frequency that the brain interprets and subsequently follows along to (“entrained”), represents the mathematical difference between the two frequencies of the left and right tones that were initially sent to the left and right ears. This is demonstrated in the diagram below.

HOW BINAURAL BEATS WORK



Upon hearing two tones of different frequencies, sent simultaneously to the left and right ears, the brain perceives a third tone based on the mathematical difference of the two frequencies. The brain then follows along at the new frequency and produces brainwaves at the same rate of Hertz (Hz).

The technical term for this process is 'frequency following response'.

For example: If the right ear is sent a tone of 200 Hz, and the left ear is sent a tone of 205 Hz, the brain's waves (brainwaves) begin to vibrate at the difference between these two signals (e.g. 5 Hz). The technical term for this process is 'Frequency Following Response' (FFR).

The Frequency Following Response (FFR) is well established across many species. It is simply a reaction generated by periodic or nearly-periodic auditory stimuli.

Even the simple beating of a drum can induce the same Frequency Following Response. This is because the rhythm contains hypnotic properties that encourage the brain to nod along.

A scientist named Melinda Maxfield, PhD, conducted research on the drumbeats used during rituals of ancient cultures. She found that they generally beat at a steady rate of 4.5 beats per second.

This consistent beat induces a trance-like state for the tribe, due to the brain shifting into a 4.5 beats-per-second brainwave frequency. On the brainwave spectrum, this would be a low Theta frequency.

Indeed, in almost every ancient culture, repetitive beat formats have played an important role in wellbeing and prosperity. For example: through the use of repetitive drumming and chanting, Tibetan monks, Native American shamans, Hindu healers and master Yogis have been able to induce meditative states that promote physical and emotional healing.

The Brainwave Spectrum

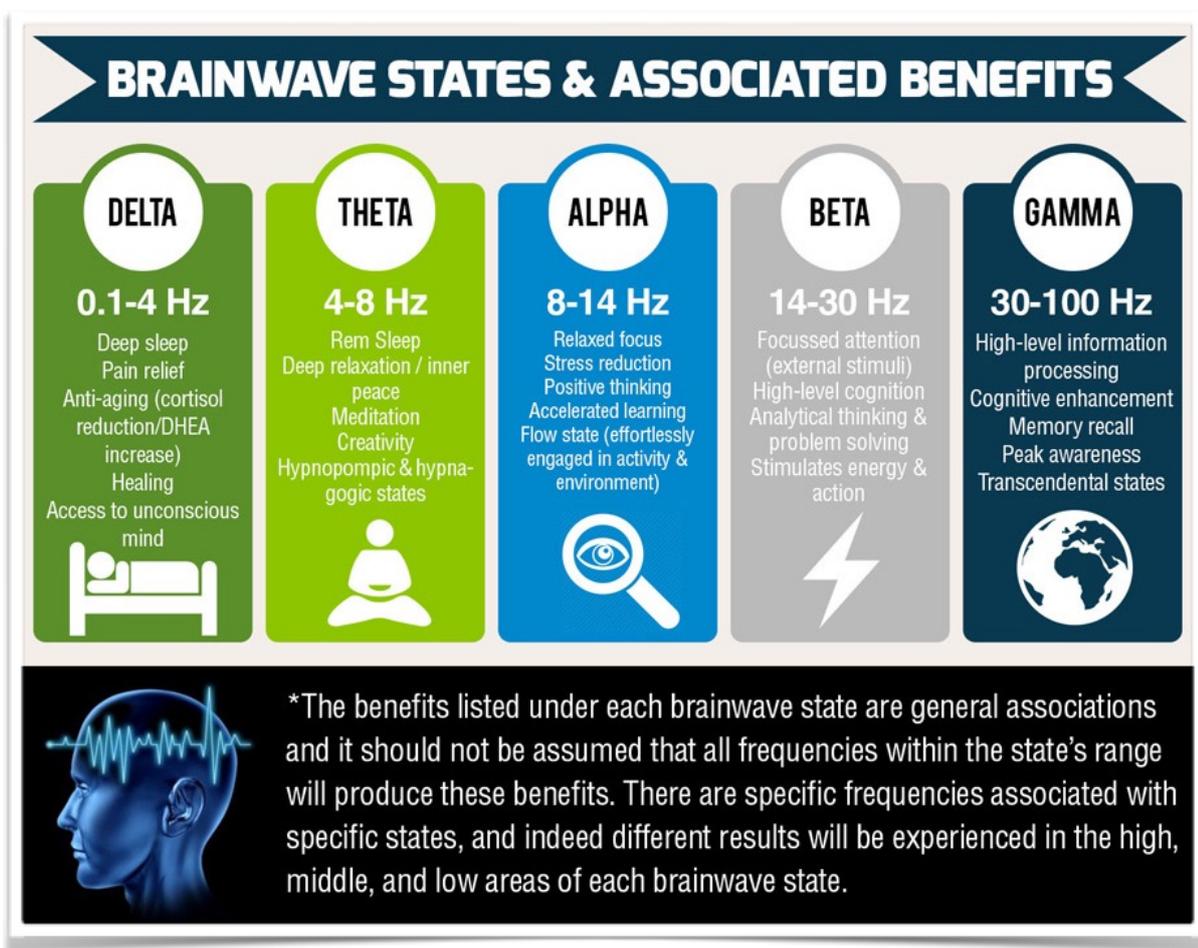
In the same way that electrical equipment runs at specific frequencies, so does the brain. These frequencies are known as brainwaves and are measured in Hertz (Hz).

When we are in high states of anxiety the speed of our brainwaves increases, and when we are relaxed the speed decreases. This concept is key in understanding how binaural beats work.

When the brain is in an awake and aware state, it is usually running at somewhere between 5-40 Hz. Within this spectrum are a number of different states, each categorized by a frequency range.

For example: when we are in a brain state conducive to learning and energetic activity, our brainwaves run at around 20-25 Hz; known as the Beta state. When in a state of deep relaxation, our brainwaves will be somewhere between 4-8 Hz; known as the Theta State.

The chart below shows the frequency range categories for the five major brainwave states. Depending on the source, you might find some differentiation between where one brainwave category starts and another ends, but generally the assumed category ranges tend to be approximately the same.



As noted in the text at the bottom of the table, not all the benefits listed in each category range will be experienced at every frequency of that range. Different mental states of being will be experienced in the low, middle, and high

areas of each range. Through research, specific frequencies have been identified as being conducive to entraining the brain to a particular state. For example: in [one](#) particular study, a frequency of 6 Hz was assessed to correlate with a meditative state.

Testing the Theory (try it yourself)

You can test the scientific theory of binaural beats by visiting our [How it Works](#) page. Scroll down the page until you come to the section that contains an audio player.

Put on your headphones, press play, and listen for approximately 30 seconds. Then, take off one of your earphones (left or right) and keep listening with the other. You will notice how the consistent, pulsating tone is lost when one earphone is removed.

Now swap ears and try the other side. When you listen individually to each earphone, you will hear the original sound frequency (tone) being sent to that ear.

When you put the other earphone back on, the brain immediately responds to the presence of both frequencies

(tones) and effectively creates a third sound frequency (tone), which is the binaural beat(s).

Please note: When you take one earphone out (left or right), move it as far away from your ear as possible. If the earphone is too close, your ear will still be able to detect the tone (vibration) being emitted from the earphone. This will cause your brain to pick up on the frequency and combine it with the frequency coming from the other earphone (still in your ear), and therefore continue to create the binaural beats effect.

2.

Using The Music

Binaural beats music replicates human brainwave states that occur within the brainwave spectrum on a daily basis.

By using the appropriate recording, we can use binaural beats music to help entrain the brain to a particular mode of operation.

For example: a person suffering from stress could induce relaxation by listening to Theta wave binaural beats. Doing so would entrain the brain to produce lower frequency waves that calm the mind and leave the listener more relaxed.

Similarly, a person who is unable to concentrate at work for long periods of time could benefit from listening to an Alpha binaural beats recording. Doing so would move the brain into what is known as the “flow state” – a relaxed but zoned-in and focussed state of mind.



Results & Expectations

Our music is designed to help you enter various desirable states relating to mental, emotional and spiritual change. Over time, this entrainment creates better synchronization between brain hemispheres and in turn improves your “whole brain functioning”.

Our music can help you achieve higher productivity, better focus, accelerated learning, improved memory, enhanced creativity, better sleep, deep meditation, and more.

The majority of people do feel a mental response during their first session. However, this is not a miracle cure and results vary from person to person.

For example: if a person who has suffered from insomnia for many years listens to one of our sleep recordings before bed, it will take longer for that person to see a sustained change in their sleep quality than someone who has had a few bad nights due to a stressful period in their life. The latter may benefit the same night and sleep very well, whereas it may take a week or more for the former to see sustained change.

What we can say is that from the moment you start listening to our music, changes in the brain begin to occur, just as they do in the body when you first begin to exercise. With a regular listening routine(discussed later in the guide), you will reap the benefits of sustained change.

Regular entrainment will encourage habitual behavior; whereby the brain will naturally begin to move into the desired state of its own accord during future occurrences of the same event.

For example: after two weeks of using a Delta binaural beats recording before bed, you may find that you are regularly sleeping deeper and longer and feel that you can reduce your usage or stop for a while. This is a natural therapy that can be used for different areas of your life, as and when you need it.



Best Practice Listening

Our music can be listened to in the same way as any other music, except that you will need headphones. The reason you need headphones is that the brain needs to hear both tones (sent to the left and right ears) at the same time to produce the desired effect.

Technically speaking, if you were closely sat between a set of speakers, with one facing your left ear and the other facing your right ear, you could listen without headphones. However, the effects would be greatly reduced – not to mention that this is an impractical way to enjoy the experience.

That being said, because of the music's relaxing properties, many of our users enjoy listening without headphones; so feel free to do that when you don't require the brainwave entrainment.

You can listen to our music anywhere at any time.

However, for optimal results, you should listen in a way that complements the intended outcome.

For example: if you are listening to a track for relaxation, such as [Chill Pill](#) or [Muscle Relaxation](#), it is best that you listen while sitting or lying down. You should also listen in a relaxed environment that is free of distraction. Doing so will help relax your mind and enhance the effects of the entrainment.

Another example would be listening to [Zen Focus](#), which is best listened to when engaged in a task that requires high-level concentration such as studying, working or reading. Similarly, you might choose to enhance your creative flow by listening to [Creativity Boost](#) while painting or writing a song.

Binaural beats music is commonly used by meditators and those seeking states of relaxation and higher levels of consciousness; thus our brand name ‘binaural beats meditation’.

It is therefore quite common for users to assume the traditional seated meditation position, also known as the ‘lotus position’, when using to recordings designed for meditation and relaxation.

If you find this position uncomfortable, you can sit on a cushion or a comfortable seat instead. You can also lie down on the couch or on the floor. If you are listening to one of our recordings designed to help you sleep better, you can listen in bed while you fall sleep, or while relaxing elsewhere up to an hour before bed.

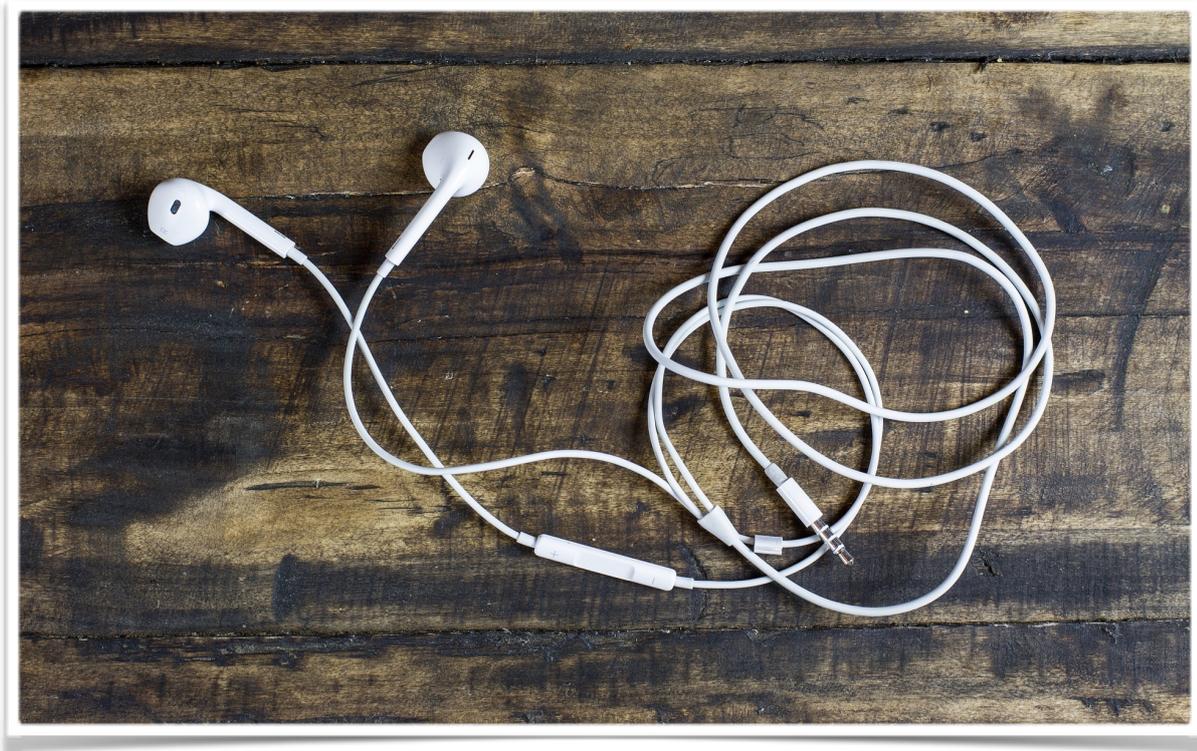
However you decide to listen to the music, the general rule is to make sure that you are as comfortable as possible, and engaged in a way that complements the desired outcome.

3.

Choosing Your Headphones

The large majority of headphones will be good enough to realize the full benefits of our music. For example, the standard earbuds – like those pictured below – will be just fine.

However, if you are using our music on a regular basis, you might want to invest in some better quality headphones to get the most out of your listening experience.



Open Vs. Closed-Back Headphones

For optimal listening, we recommend using closed-back headphones.

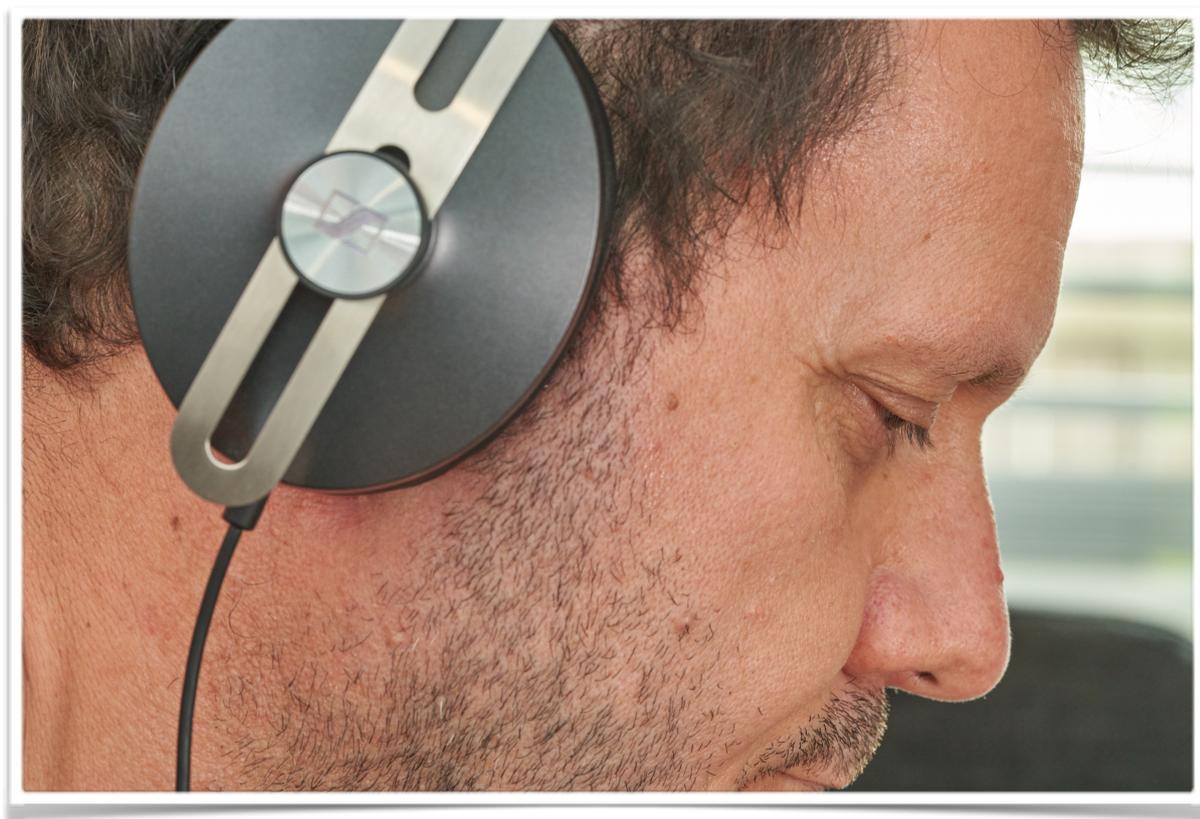
If you aren't aware of the difference between closed-back and open headphones, here is a short explanation:

Closed headphones have a sealed cup, whereas open headphones are "open" behind the driver. Basically this means that closed headphones will stop you hearing outside sounds, and stop sound leaking from your headphones into the earshot of others.

In short, closed headphones tend to give you a more "in head" soundstage, which is great for listening to ambient-style music in general.

Budget models of closed-back headphones, despite having a sealed cup, may have an inferior sound that produces reflections and resonances. So to be on the safe side, it is best to choose a pair from the likes of Bose, Sennheiser, Sony, or any other popular brand known to produce good headphones.

[Amazon.com](https://www.amazon.com) regularly has deals on affordable, good quality closed-back headphones. We have also written an extensive post on this subject to help you choose the right pair for your budget. [Read that post here.](#)



Noise-Cancelling & Wireless Headphones

Both noise-cancelling and wireless headphones are generally fine to use with our music. The intention of noise-cancelling headphones is to cancel out external sound, not to interfere with the music. Therefore, the binaural beats frequencies within the music should remain unaffected.

There are two main types of wireless headphones used to listen to music. The first are those that use a radio frequency transmitter – a type of aerial box that transmits the signal to your headphones. Such headphones tend to be used with home stereo systems because the signal has a long range and is able to pass through walls.

The second, and most common form of wireless headphones, are those that use a Bluetooth signal. At one time Bluetooth was considered low quality because it applied heavy compression to the sound. However, the technology has evolved and newer versions of Bluetooth headphones are capable of producing CD quality playback.

Setting the Volume

When listening to our music, set the volume at a comfortable level. You don't want the music to be too loud, but at the same time you don't want the music to be so low that you are easily distracted by external sounds.

Increasing the volume to a level that isn't comfortable will not enhance the effect of the entrainment. You needn't worry about the music being too low either; because as

long as the music is audible through headphones the desired effect will occur.

Some of our recordings may appear to be slightly lower in volume than others, but this is generally due to the ear's perception of the sound design rather than the actual volume. The sound design also dictates the prominence of the binaural beats track (the tone/hum sound underneath the music), which you may or may not be able to hear, depending on the recording. We recommend that you simply adjust the volume of each track to a level you are comfortable with.

4.

Your Listening Routine

Recommended Usage Limits

For beginners, we recommend listening to a maximum of three recordings per day, of either the 30 or 60-minute versions. This level of daily usage is more than sufficient to bring about positive change in the chosen area of entrainment.

Those who listen to this type of music on a regular basis may choose to listen more frequently. Indeed, many of our users leave a particular track on loop and listen for two or three hours at a time. However, for beginners we recommend the aforementioned usage as a starting point.

We recommend that you do not use Beta and Gamma recordings in the evening. These are high-frequency recordings that stimulate wakefulness, as opposed to Theta and Delta which promote the production of lower frequency brainwaves and, generally speaking, a relaxed state of mind. You can find out which frequency range a particular product uses by navigating to the relevant product page on our [website](#).



Developing a Daily Routine

We recommend developing a daily routine based around the goals that you are targeting. For example: you might listen to [Positive Thinking](#) in the morning to set you up for the day with a positive mindset; then Zen Focus while you are working – for high-level productivity; and then Chill Pill when you get home in the evening to de-stress from the day.

Once you see positive change in a particular area, you can choose to move on and try a different recording for a different

purpose. For example: if you have been starting your day with Deep Meditation for two weeks in a row, you might choose to change your routine and start the day with [Abundance Meditation](#).

It is a good idea to adapt your listening routine to suit your current situation. For example: perhaps you are interviewing for a new job and you want to make sure that you get a good night's sleep before the big day, or you want to reduce symptoms of anxiety before the interview. In this case, you might choose to use [Blissful Sleep](#) the night before, and [Anxiety Release](#) on the morning of the interview.

5.

Next Steps & Helpful Links

We hope that you have found our guide interesting and that you are now ready to join hundreds of thousands of other users who are already benefiting from our special music.

If you have a question that wasn't answered in this guide, please have a read over our [User FAQ](#). Alternatively, you can contact us by email using the form on the [contact page](#).

If you have a question about our subliminal audio products, which use a combination of binaural beats and subliminal messaging, please have a read over the [Subliminal Audio FAQ](#).

To choose your downloads and get started now, you can visit our store by [clicking here](#).

We hope you thoroughly enjoy our music, and we look forward to hearing from you soon.

Disclaimer:

While our programs contribute to wellness, they are not intended to replace medical diagnosis and treatment. If you have a history of seizures, auditory disorders, a heart condition, or other adverse mental condition(s), or you are pregnant, or under the age of 18, do not listen to our music without first consulting your physician. Do not listen to our music while driving or operating heavy equipment. In the unlikely event that you experience any unusual physical or mental discomfort, discontinue use immediately. All claims whether expressed or implied, including merchantability and fitness for a particular purpose are disclaimed.

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