

SENSIMETRICS

whist
USER GUIDE

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Introduction

This Introduction presents a few guiding principles to keep in mind as you search for effective sound therapy using Whist.

1. When it comes to tinnitus, only you know what works. Tinnitus is entirely subjective. It cannot be measured with instruments or even verified objectively. Only you know that you have it and what it sounds like. By the same token, only you will know when an external sound is effective in reducing the loudness or annoyance of your tinnitus. You must trust your own judgment about whether a type of sound provides any relief.

2. The sound therapies described here are only examples. Three ways of using sound for relieving tinnitus are described in other Help topics -- Masking, Low-Level Stimulation, and Residual Inhibition. These are methods described in the research literature that have been reported to be successful for some patients. Try to follow the instructions for these methods as best you can. However, do not feel that if you cannot find relief from them that that is the end. . .

3. Some searching may be needed. After you get used to using Whist it will be easy to explore various sounds. Feel free to experiment with the pitch, noisiness and volume controls, and listen to sounds for different lengths of time. Try to find the best combination for reducing the loudness or annoyance of your tinnitus. Always be careful, however, not to listen to sounds that are too loud. If a sound makes you tinnitus worse, or it produces a feeling of 'fullness' in your ear(s), it is too loud and its volume should be reduced.

Audio Setup

Step 1 Connect headphones (or earphones, or earbuds) to the audio output jack on your computer. Do not use loudspeakers. You will achieve much more consistent sound levels with headphones, and you will not disturb others who are nearby.

Do not put the headphones on yet.

Step 2 Start Whist and turn sound on by clicking the Play button.

Step 3 Bring the headphones closer to your ears and you should be able to hear the sound being produced by Whist. If you do not hear sound, turn the volume up using the Volume slider (click on and drag the icon along the line).

Step 4 If you still do not hear anything, or if the sound is not loud enough when the Volume slider is at its highest setting, you may need to adjust the Windows Volume Control. You can do this by going back to Whist, clicking Help, and then clicking Adjust Volume.

If you can achieve adequate volume then you need to go through these steps again only if the volume settings have changed.

Step 5 If you still do not hear sound after going through the previous steps, check these possibilities:

Are the headphones connected to the correct jack? The headphone jack on computers is usually identified either by color -- green for headphones -- or by a headphones icon.

Is the wrong audio device selected? Computers sometimes have multiple devices that play audio. You can check these devices by right-clicking the loudspeaker icon in the Windows taskbar (the rectangular area on your desktop that holds icons for frequently-used programs, usually located on the bottom of the screen). After you right-click the loudspeaker icon, select Playback devices. The audio devices on your computer will be shown. The one you want to have selected as default is usually called Speakers. Select it and then set it as the default. Re-start Whist to see if sound is now produced.

If these steps fail to produce sound, there might be something more serious wrong. Try to get help from someone knowledgeable about computers.

Adjust Volume

To get the maximum volume from Whist and your computer's audio system:

Step 1 Make sure sound is playing from Whist.

Step 2 Look at the Volume Mixer window, which should be showing. Find the sliders labeled 'Whist Help' and the one on the far left, which is usually labeled 'Master Volume', or 'Device'. Adjust these sliders upwards in that window to make the sound louder.

Using Whist

These are the primary controls in Whist:

Play/Stop button - click this to turn sound on or off.

Sound Type - select either Tone or Noise. A tone is a steady pure sound, like a whistle. Noise has a fluctuating noisy quality.

Pitch - move the slider along the line to adjust the pitch of the tone or noise.

Noisiness - move the slider along the line to adjust the noisy quality of a noise. If Tone is selected as the Sound Type, then this control does not apply.

Balance - moving the slider shifts the sound left or right.

Volume - adjust the slider to control the volume.

Timer - use this to monitor the time of an exposure or of residual inhibition. The timer does not affect the sound that is played; it only marks time.

Pulsed - if this box is not checked the sound will play continuously. If the box is checked, the sound will be pulsed on and off cyclically.

On Time - if Pulsed is checked, use this slider to set the length of time that the sound will be on.

Off Time - if Pulsed is checked, use this slider to set the length of silence between sound presentations.

File menu commands:

Load Settings - use this to load in primary sound controls that have been previously saved to a file.

Save Settings - use this to save the current primary sound controls to a file.

The **Load** and **Save** commands allow multiple users to save and load their favorite settings conveniently.

Export Sound to File - use this command if you wish to save the current sound to a file for use with an audio player. If the sound is continuous (i.e., Pulsed is not checked) the audio file will be a 1-second clip of the sound that is currently selected. If the sound is pulsed, the audio file will contain one complete on/off cycle of the sound currently selected. In either case you can re-create the sound by setting your audio player to 'Loop', which plays the audio file repeatedly. You can save the audio file in .wav or .aac format.

Exit - close the program

Help menu commands:

Audio Setup - brings up instructions for setting up your computer's audio system.

Using Whist - brings up the instruction you are currently viewing.

Adjust Volume - presents instructions for optimizing volume by adjusting the Windows volume controls.

Tips for RI - provides guidance for matching and inhibiting your tinnitus.

About - gives details on Whist.

Matching Tinnitus

The sound therapy methods described here (see other Help topics -- Masking, Low-Level Stimulation, and Residual Inhibition) all work best if you have a good idea of the pitch of your tinnitus.

These steps for matching your tinnitus should work for the majority of persons whose tinnitus has a clear pitch.

Step 1. Choose the Sound Type

With Whist running, listen to the two different sound types. First select Tone and set its Volume to a comfortable level. Tones are very steady, constant, sounds that can be varied in Pitch and Volume. Practice changing the Pitch slider to listen to the full range of pitch. This will give you a feel for the range of pitch, which will help you locate your own tinnitus on that scale.

Next, switch to Noise, which is a fluctuating sound. Noise has an associated Noisiness control, in addition to Pitch and Volume. If you set Noisiness to the far left it will sound a lot like a tone, but with some warbling. If you change Pitch now you will hear that noise (with low-noisiness) can produce the same kind of pitch variation as a tone. If you now move the Noisiness slider to the right you will hear the noisiness increase and the simple pitch sensation become less clear.

Your goal in this step is to simply select the Sound Type, either Tone or Noise, whichever one is most like your tinnitus. If your tinnitus is very steady, choose Tone. If your tinnitus has noise-like fluctuations, choose Noise.

Step 2. Choose Left/Right Balance

Adjust the Balance slider to see that it shifts the sound from left to right. If your tinnitus is in both ears, or somewhere inside your head, put the sound at one ear or the other. If your tinnitus is mainly on one side, put the Whist sound on the opposite side. This will make it easier to match the Whist sound to your tinnitus.

Step 3. Match Your Tinnitus Pitch

Make sure the volume of the Whist sound is at a comfortable level. If you are using Noise, put the Noisiness slider towards the left end.

Your goal in this step is to adjust the pitch until it matches the pitch of your tinnitus. If it helps, turn the sound on and off to compare it to your tinnitus.

Step 4. (If Using Noise) Match Your Tinnitus Noisiness

With Pitch set to your match from Step 3, now adjust Noisiness so that it is most like your tinnitus.

After you are satisfied that you have matched your tinnitus as best you can, you should save those settings. You can do that easily by going to the File menu and clicking Save Settings. Give the file a name that you will remember, such as "tinnitus match." If someone else might be using Whist, add your name or initials to the file name to identify the file as your settings.

Tinnitus Masking

Masking is a type of sound therapy in which external sound is used to cover up, or mask, tinnitus.

Your goal is to find a sound that can mask your tinnitus but that is also less annoying to listen to than your tinnitus.

Step 1. Start with your tinnitus match

If you have matched your tinnitus already, start with a tone or a narrow noise that is either slightly lower or higher than your tinnitus.

If you tried but were unable to match your tinnitus, start with a wide noise (select Noise and adjust the Noisiness slider to the right).

If you haven't tried to match your tinnitus, please go to the 'Matching Tinnitus' Help topic.

Step 2. Find Your Minimum Masking Level

Step 2-a. Prepare the Masking Sound. Use the settings that match your tinnitus.

If your tinnitus is in one ear, change the Balance to deliver the Whist sound to that ear. If the tinnitus is in both ears, or in your head, adjust Balance to the middle so the sound goes to both ears.

Then turn the volume all the way down in preparation for the next step (use the Whist Volume control, not Windows or any other volume control).

Step 2-b. Find Your Minimum Masking Level. With the volume all the way down, you should hear your tinnitus but not the Whist sound. From there, raise the volume until the external sound is loud enough to mask your tinnitus. If you have trouble distinguishing the external sound from your tinnitus, lower the pitch enough so that they are clearly different. Try it a few times so that you are clear about when tinnitus is masked and when it's not as you vary volume.

When you've found the volume at which your tinnitus is just barely masked, note the numerical value of the volume level – that is your Minimum Masking Level (MML) for the sound you are using. Different sounds may have different MMLs.

Feel free to repeat this procedure with sounds of other pitch and noisiness.

Low-Level Stimulation

Low-level stimulation is a type of sound therapy in which external sound is used to reduce the loudness of (i.e., suppress) tinnitus. It is unlike masking in that the external sound is lower in loudness and does not mask the tinnitus. The external sound is actually lower in loudness than the tinnitus, or it may be inaudible, but it nevertheless reduces the tinnitus.

Your goal is to find a low-level sound that can suppress your tinnitus.

The first two steps used to find a sound for low-level stimulation are the same as those used in finding the minimal masking level of a sound used for masking.

Step 1. Start with your tinnitus match

If you have matched your tinnitus already, start with a tone or a narrow noise that is either slightly lower or higher than your tinnitus.

If you tried but were unable to match your tinnitus, start with a wide noise (select Noise and adjust the Noisiness slider to the right).

If you haven't tried to match your tinnitus, please go to the 'Matching Tinnitus' Help topic.

Step 2. Find Your Minimum Masking Level

Step 2-a. Prepare the Masking Sound. Use the settings that match your tinnitus.

If your tinnitus is in one ear, change the Balance to deliver the Whist sound to that ear. If the tinnitus is in both ears, or in your head, adjust Balance to the middle so the sound goes to both ears.

Then turn the volume all the way down in preparation for the next step (use the Whist Volume control, not Windows or any other volume control).

Step 2-b. Find Your Minimum Masking Level. With the volume all the way down, you should hear your tinnitus but not the Whist sound. From there, raise the volume until the external sound is loud enough to mask your tinnitus. If you have trouble distinguishing the external sound from your tinnitus, lower the pitch enough so that they are clearly different. Try it a few times so that you are clear about when tinnitus is masked and when it's not as you vary volume.

When you've found the volume at which your tinnitus is just barely masked, note the numerical value of the volume level – that is your Minimum Masking Level (MML) for the sound you are using. Different sounds may have different MMLs.

Feel free to repeat this procedure with sounds of other pitch and noisiness.

Step 3. Try to suppress tinnitus

Starting with the MML, you should be unable to hearing your tinnitus (because it is masked).

Lower the volume a small amount, about 5 dB. Refer to the numerical value on the volume slider. Listen to this sound for a minute or two to see if your tinnitus is reduced.

If your tinnitus is not reduced, try these steps:

- different volume levels.
- sounds with different pitch; for each adjust the volume to where it is just barely audible.

- use Noise with minimal Noisiness (adjusted to the far left). Some research indicates that sounds with those characteristics are most effective.

Residual Inhibition

Residual inhibition is a type of sound therapy in which external sound is used to elicit a temporary reduction or elimination of tinnitus after the sound ends.

Your goal is to find a sound with which you can safely and reliably reduce or eliminate your tinnitus.

The first two steps used to find a sound for residual inhibition are the same as those used in finding the minimal masking level of a sound used for masking.

Step 1. Start with your tinnitus match

If you have matched your tinnitus already, start with a tone or a narrow noise that is either slightly lower or higher than your tinnitus.

If you tried but were unable to match your tinnitus, start with a wide noise (select Noise and adjust the Noisiness slider to the right).

If you haven't tried to match your tinnitus, please go to the 'Matching Tinnitus' Help topic.

Step 2. Find Your Minimum Masking Level

Step 2-a. Prepare the Masking Sound. Use the settings that match your tinnitus.

If your tinnitus is in one ear, change the Balance to deliver the Whist sound to that ear. If the tinnitus is in both ears, or it sounds like it is inside your head, adjust Balance to the middle so the sound goes to both ears.

Then turn the volume all the way down in preparation for the next step (use the Whist Volume control, not Windows or any other volume control).

Step 2-b. Find Your Minimum Masking Level. With the volume all the way down, you should hear your tinnitus but not the Whist sound. From there, raise the volume until the external sound is loud enough to mask your tinnitus. If you have trouble distinguishing the external sound from your tinnitus, lower the pitch enough so that they are clearly different. Try it a few times so that you are clear about when tinnitus is masked and when it's not as you vary volume.

When you've found the volume at which your tinnitus is just barely masked, note the numerical value of the volume level – that is your Minimum Masking Level (MML) for the sound you are using. Different sounds may have different MMLs.

Step 3. Try for Residual Inhibition

Step 3-a. Set Volume. Adjust the volume control to a level 10 dB higher than your MML found in Step 2-b. (and keep Pitch and Noisiness (if used) as they were in Steps 2-a and 2-b). This is now your exposure sound.

Step 3-b. Play Exposure Sound for One Minute. Listen to your exposure sound for one minute; use the timer if you wish. Then turn the sound off.

Step 3-c. Is there a reduction in Your Tinnitus?

If your tinnitus is lower than normal in loudness, or eliminated, immediately after the sound is turned off, you have experienced residual inhibition. Pay attention to how long it takes for the tinnitus to return to its usual loudness; reset and re-start the timer if you want to measure the time.

Warning

You should discontinue listening and not try for residual inhibition anymore if you experience either of these conditions after exposure:

- 1) **YOUR TINNITUS IS LOUDER AFTER EXPOSURE.** A small fraction of people experience an increase in their tinnitus after an exposure intended to induce RI. If you find that to be the case, then you should discontinue use of Whist.
- 2) **YOU NOTICE A CHANGE IN YOUR HEARING.** If you have a feeling of fullness in either ear or a sensation of being able to hear less well than you could before exposure, then you should discontinue use of Whist. This is a sign that the exposure sound is too loud.

Step 3-d. Try Again. If you did not get RI in Step 3-c, (and your tinnitus did not experience either of the warning signs after the exposure) increase the volume by 10 dB and try again. This should now be 20 dB above your MML. Use the same one-minute exposure duration. If this level is uncomfortably loud, lower the volume until it is comfortable.

Warning

If you experience either of these warning signs after listening at MML+20 dB:

- 1) **YOUR TINNITUS IS LOUDER AFTER EXPOSURE,**
 - OR
 - 2) **YOU NOTICE A CHANGE IN YOUR HEARING,**
- then you should stop listening at that volume. If you did not experience either of these signs after listening at MML+10 dB, you can return to listening at that volume.

Step 3-e Try Again, or Try to Maximize RI. If you did not get RI in the previous steps (and you did not experience either warning sign), or you did get RI and want to try to improve the degree and duration of it, try again with other settings. Here are some suggestions:

- Lower the pitch. Some research indicates that a pitch setting about 25% lower than the tinnitus pitch match is best for residual inhibition. For example, if your tinnitus pitch match is 8 kHz, set the Whist pitch to 6 kHz.

- Increase volume. But be careful -- you don't want to damage your hearing (any more than it already is). Do not listen to any sound that is uncomfortably loud. And be on the watch for the two warning signs -- worse tinnitus or worse hearing after exposure. If you experience either of these, lower the volume.

- Listen repetitively. The benefits of listening repetitively have not been studied. However, there are anecdotal reports of long-duration inhibition being achieved (by a few patients) after extended use of tinnitus maskers.

- Increase exposure duration. Go to two or three minutes exposure. Research indicates, though, that there is relatively little increase in RI with exposure durations longer than a few minutes.

Remember - These steps are offered as guidelines. With some searching on your own you may find the exposure sound that best induces residual inhibition for you.

After you find an exposure sound that effectively and reliably achieves residual inhibition of your tinnitus, you can repeat the exposure whenever you wish. You can also set up an on/of exposure cycle by checking Pulsed on the Whist interface, and then setting the On and Off times.

You can also export your exposure sound to an audio file file that can be loaded onto a portable audio player. Please see the Using Whist Help topic for instructions on saving settings and exporting audio files.

Other Notes

High-pitch sounds. You may find that you cannot hear sounds at the upper end of the pitch range, even with maximum volume. This can be due to limitations in either your headphones or your hearing, or both. Many headphones do not deliver high-pitch sounds very well, so do not be surprised if the sound cuts out above about 10,000 Hz. If a person with good hearing can listen to these sounds, you might be able to determine if it is your hearing or the headphones that are the limiting factor. It may take some searching to find the best exposure sound given those limitations.