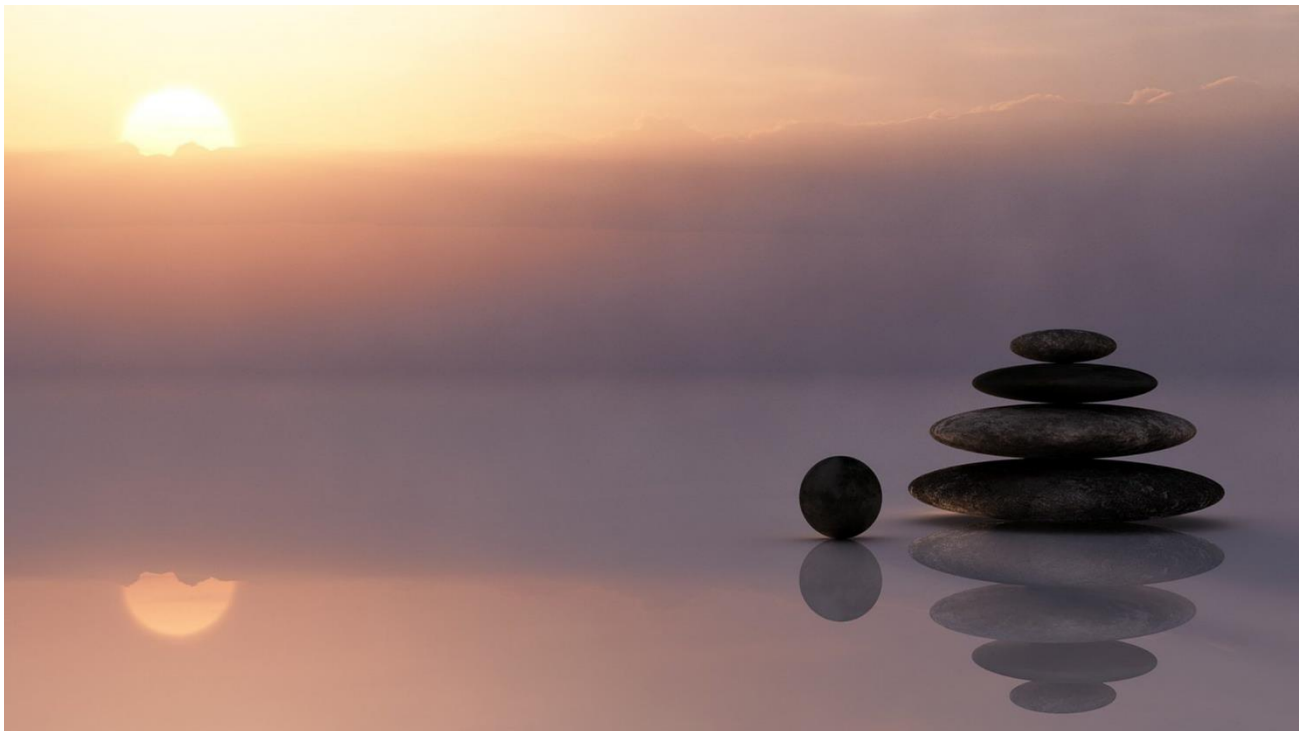


TinnMasker™

Tinnitus Relief Application

User Guide

by Alango - Wear & Hear





Dear User,

Thank you for your interest in our application.

Please follow the steps documented in this user guide to install and use the application.

TinnMasker is an experimental application that will serve as a prototype for future development. We hope you like the idea and will help us make it better.

We will be awaiting your feedback.

Alango Technologies

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1. Introduction

If you experience ringing or noise in your ears, you have “tinnitus”.

There are two types of tinnitus, *objective* and *subjective*. Objective tinnitus is real acoustic noise that is generated in your head by a turbulence of congested blood flow, “loose” bones, or other physical phenomena that, in many cases, may be fixed. Of course, you would need to consult a doctor to achieve this. Objective tinnitus is rare and it is much more likely that you have subjective tinnitus. Subjective tinnitus is not a real acoustic sound; it is a phantom sound that is generated in your auditory system, which includes the brain.

There are some working approaches that can reduce the problem, or even inhibit it for some time. Tinnitus masking is probably the most common one. Tinnitus masking consists of hearing an external sound that perceptually resembles the internal, phantom sound, but has a slightly louder volume so that the internal sound is not heard or, as we say, “it is masked by external stimuli”. Our brain knows how to ignore continuous external sounds and after getting used to them, the brain will ignore them – together with the actual tinnitus. This artificial external sound is called the “Tinnitus Masker” or, simply, “the Masker”. For some people, after hearing the Masker for certain amount of time and then switching it off, the tinnitus may be temporarily attenuated (weakened), or completely disappear. This phenomenon is called “residual inhibition” and it is experienced by 8 out of 10 people. The tinnitus will eventually come back, but the process of using the Masker may be repeated.

The key to successful tinnitus masking and inhibition is the ability to define and play the real sound that matches, as closely as possible, the phantom sound of the tinnitus in pitch (frequency), sharpness, and volume. The length of time you will need to listen to the matched “real world” sound to alleviate your tinnitus, as well as the length of time your tinnitus is attenuated or completely absent between applications of the Masker, is unique to each person.

The TinnMasker application was developed to make the process of matching your personal tinnitus as simple and intuitive as possible. At this stage it is available as a Windows PC application. Once we have enough feedback to improve and perfect it, we will integrate TinnMasker into our Wear & Hear line of personalized Bluetooth hearing amplifiers. In the meantime, you can already benefit from it. Simply connect your computer to a speaker, wired headphones, or a [Bluetooth headset](#) (if you want wireless mobility near your computer). In general, Bluetooth is limited to about 10 meters (~30 feet), but you can approximately triple this range with the [HearLink PLUS](#) long-range transmitter paired with one of the BeHear personalized hearing amplifiers.

TinnMasker is an experimental application that serves as a prototype for future development. We hope you will find it beneficial and join the effort to make it better. We eagerly await your feedback.

2. Installation

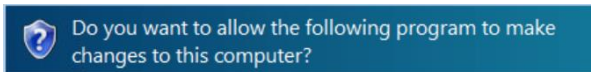
2.1 Equipment Requirements

The **TinnMasker** application requires:

- A personal computer with Windows 10 Operating System
- At least 25MB free disk space
- Screen resolution of 1920x1080 or higher
- Headphones, desktop speakers, or a Bluetooth headset

2.2 Step-by-Step Installation

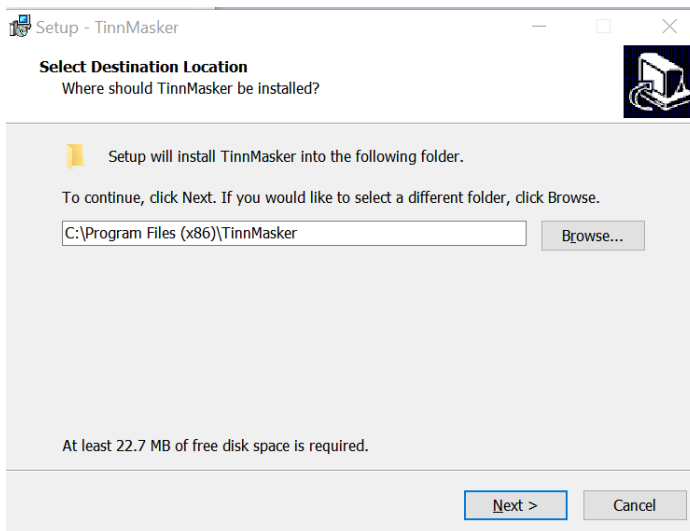
1. Open the installation file named “Alango_TinnMasker_setup.exe”.
2. Allow the application to make changes: click “Yes”.



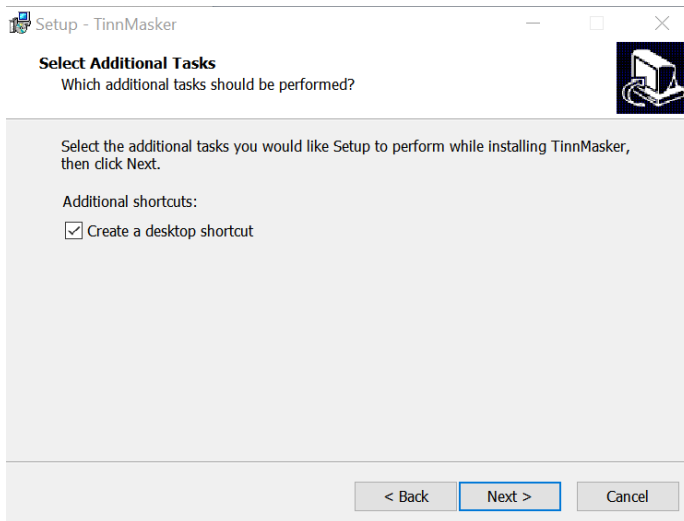
3. Next, the license agreement will appear automatically. Please read it carefully. The license terms are an agreement between **Alango Technologies LTD** and you.

BY USING THE APPLICATION, YOU ACCEPT THE LICENSE TERMS. IF YOU DO NOT ACCEPT THE TERMS, YOU CANNOT USE THE APPLICATION.

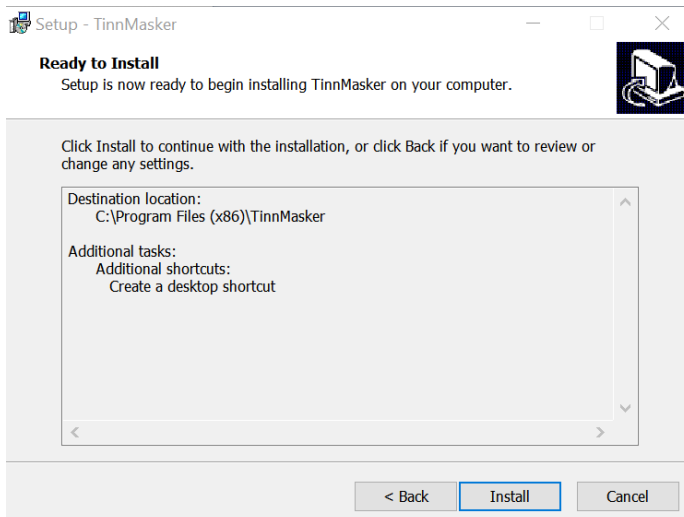
4. To install the application in default location, click “Next”. To change the location click “Browse”:



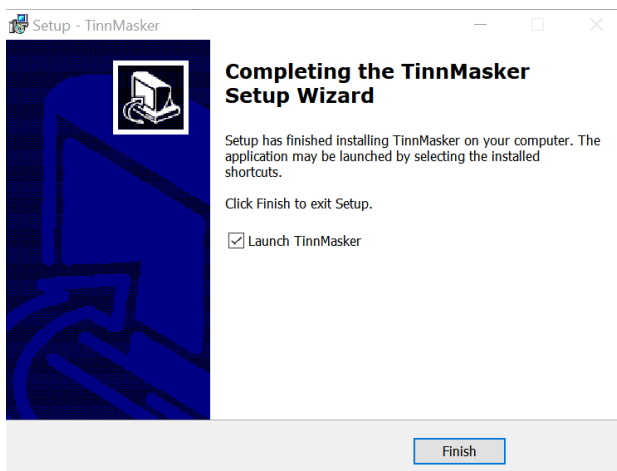
5. Now, create a desktop shortcut:



6. To start the installation process press "Install":

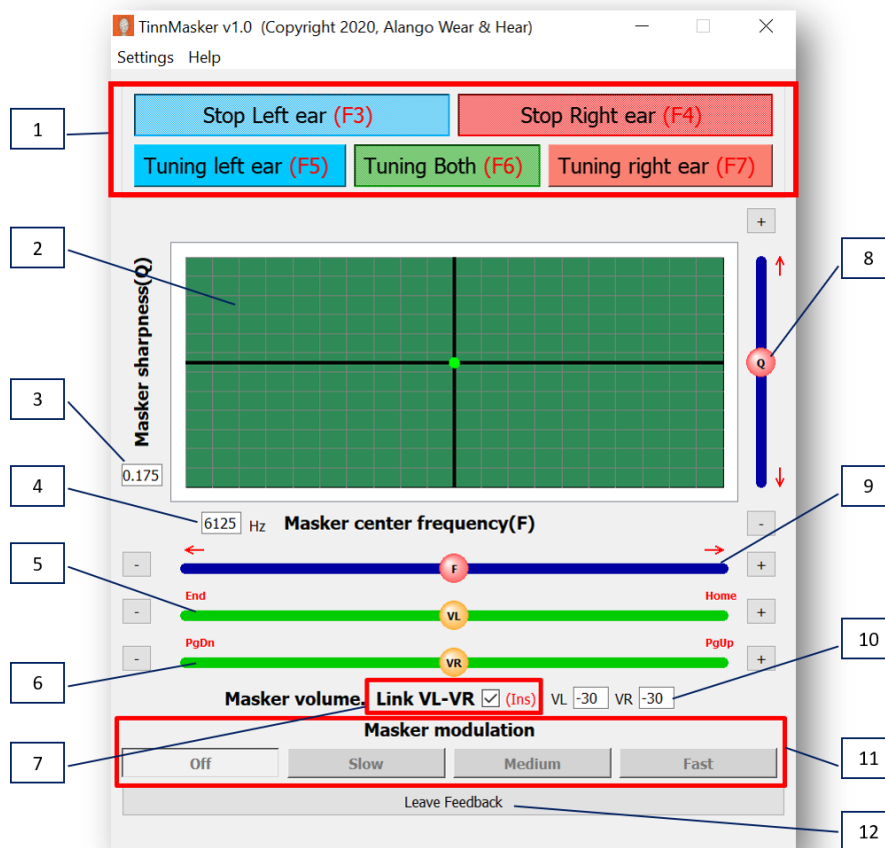


7. If the checkbox is marked the application will launch immediately:



3. Operation

3.1 Control Panel



1. F3, F4, F5, F6, F7: keyboard shortcuts for the main control panel ([see detailed explanation for each](#)).
2. Grid field: Tunes the Masker sound.
Gray = no tuning; Red = right ear only; Blue field = left ear only; Green = both ears
3. Numeric value representing **sharpness** of masking sound
4. Numeric value representing **center of frequency** for masking sound
5. Volume slider for left ear
6. Volume slider for right ear
7. Link check box
8. Sharpness slider (corresponding numerical value is shown in #3)
9. Frequency slider (corresponding numerical value is shown in #4)
10. Numeric value of the Masker sound (VL = left ear volume, VR = right ear volume)
11. Masker modulation panel
12. Automatically opens feedback form on the Alango – Wear & Hear Web site

4. Step-by-Step Tuning Guide


You can control the TinnMasker application with a mouse or by using the keyboard shortcuts shown in red in the application interface.

4.1 Connect and Check Your Device

TinnMasker can be used with wired or wireless headphones or speakers.

TinnMasker will use the default playback device defined by Windows on your computer.

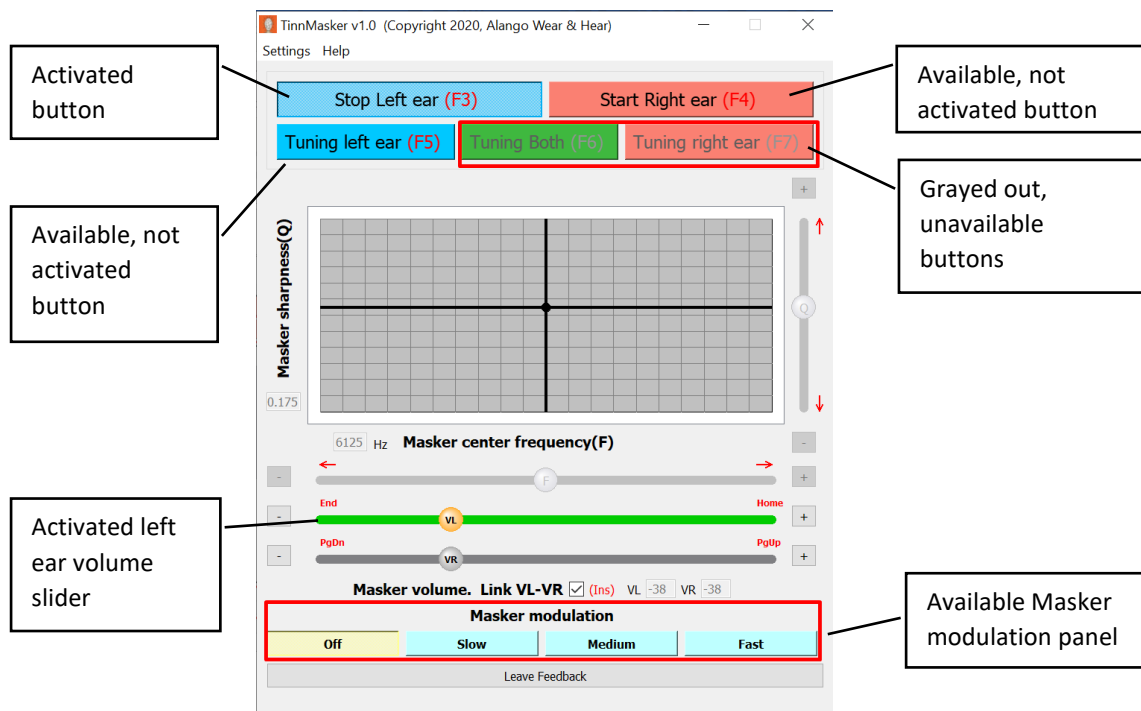
4.2 Launch the Application

If it is not already running, launch the TinnMasker application by clicking the  icon on your desktop. There are colored “Start Left ear” and “Start Right ear” control buttons located at the top of the application. You can switch the buttons ON/OFF independently. Before the devices are operational, all other controls are grayed out and non-operational.

Note: In this document, for simplicity’s sake, we assume that your tinnitus sound is similar for both ears. If it is not, you can manipulate the masking sound for each ear, individually, using the colored buttons at the top of the application. For more info about setting the masking sound individually for each ear, refer to the [“Tuning One-Sided Tinnitus \(or Masker Tuning for Each Ear Separately\)”](#) section of this document.

4.3 Tuning Left and Right Ears Simultaneously

Switch the “Start Left ear” control button ON. The color intensity of the button will change, and the left volume control slider (located beneath the tuning grid) will turn green. Now the “Tuning left ear” button is available for use, as is the left ear volume slider.



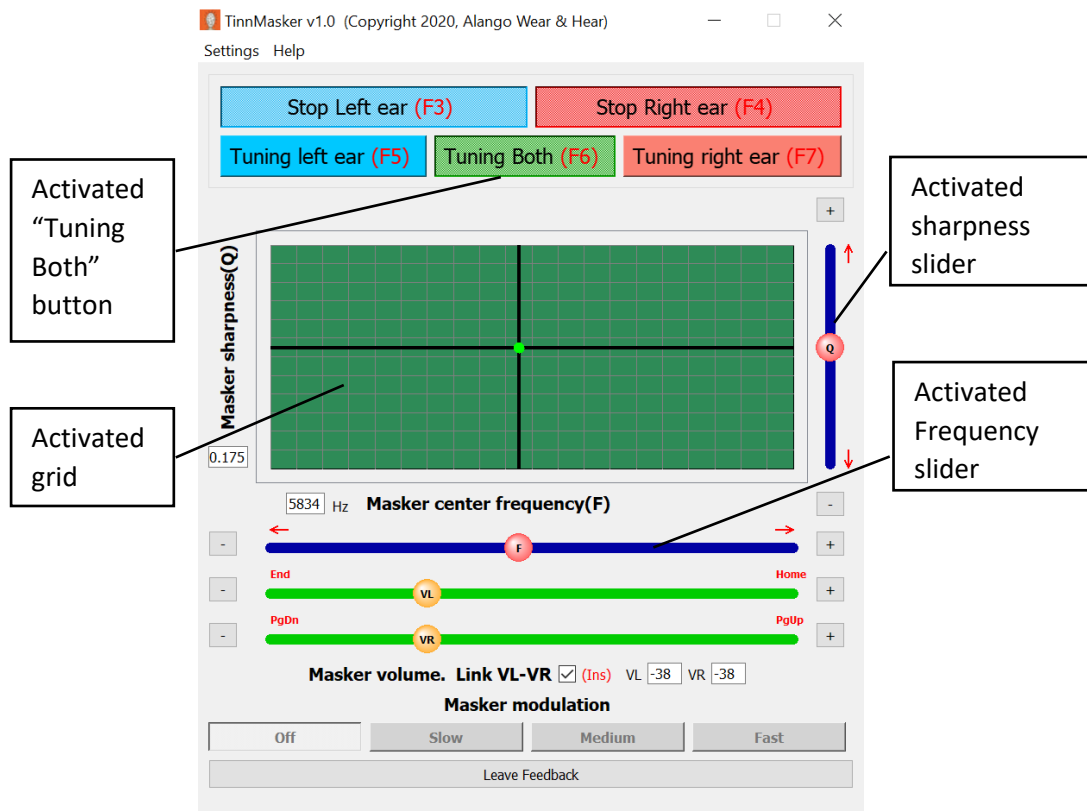
Now repeat the process for the right ear.

After activating the buttons you should hear the TinnMasker sound in both ears. If not, try to increase the volume using either the left (VL) or right (VR) volume slider. By default, they are linked together. If you still do not hear any sound check your device, as well as the computer's volume.

4.4 Matching TinnMasker Sound to Your Tinnitus Sound

The goal of this procedure is to modify the “real world” acoustic sound that you hear to match your individual “phantom” tinnitus sound.

1. **Masker volume sliders:** Move the sliders to the right to set the Masker volume to the level that is about twice as loud as your tinnitus.
2. **Masker sharpness grid:** Activate tuning in both ears simultaneously by pressing the green “Tuning Both” button. The two-dimensional grid turns green and the “F” and “Q” sliders turn blue to indicate that they are now active.



3. **“Q” slider (sharpness):** Move the dot on the slider up and down to find the degree of sharpness (clarity) that best matches the sharpness of your tinnitus.
4. **“F” slider (frequency or pitch):** Move the dot on the slider to the left (decreasing the pitch) and to the right (increasing the pitch) in an attempt to match the Masker’s frequency to that of your tinnitus.

Note: To move the sliders gradually, use the “-” and “+” buttons located on either side of each slider.

4.5 Using the Grid

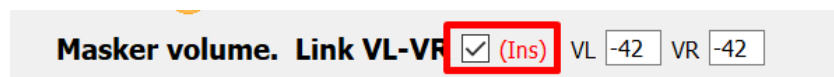
You may change both the “F” and “Q” values simultaneously by clicking anywhere on the grid. Try to identify the cell where the Masker pitch and sharpness best match your tinnitus. When you are close to the target, use the “-” and “+” buttons of the corresponding slider to adjust the Masker pitch (F) and sharpness (Q).

4.6 Masker Volume

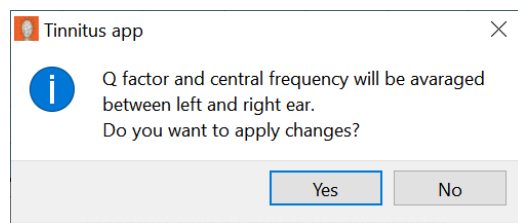
During the tuning process you can always adjust the Masker volume so that it is only slightly louder than the tinnitus sound. After your brain adapts, you can continue changing the Masker volume occasionally to provide the best masking experience. You can make the Masker volume fluctuate by pressing one of the buttons in the Masker Modulation section. Choose the most pleasant modulation speed.

4.7 Tuning One-Sided Tinnitus (or Masker Tuning for Each Ear Separately)

Enable the ear where you hear the tinnitus (F3 or F4), and then enable its tuning (F5 or F7). The procedure for tuning a single ear is the same as described above for two ears. After finishing with one ear, you can tune the other. You can have different Maskers for the left and right ears. You can also set different volumes for each ear. In that case, you need to uncheck the Link check box:



If you want to switch to simultaneous tuning again this message may appear:



If this window appears it is because the application has detected a difference in the Masker values defined for the left and right ears. Click “Yes” to create identical Maskers for each ear by averaging the parameters; click “No” to preserve the unique values for each ear.

4.8 Finalizing the Tuning

After you have located the Masker sound which best matches your tinnitus, disable the tuning process by clicking F5 and/or F7. If you want to pause the Masker sound, switch off the left and/or right ears (F3 and/or F4). The Masker settings are saved automatically when you exit the TinnMasker application. Now you are in full control of your tinnitus Masker.

4.9 Your Feedback

Please let us know what you think of this application! Share your experience with us and submit your recommendations for improvements. This can be done easily by pressing the “My Feedback” button located at the bottom of the TinnMasker window. The special [TinnMasker feedback page on our Web site](#) will be launched in your Internet browser.

Alternatively, send us an e-mail at tinmasker@wearandhear.com.

5. Additional Information

5.1 Keyboard Shortcuts

Keyboard Shortcut	Function
F1	Opens this User Guide from the application
F3	Turns the sound transmitted to the left ear ON/OFF
F4	Turns the sound transmitted to the right ear ON/OFF
F5	Turns the tuning sound parameters transmitted to the left ear ON/OFF
F6	Turns the tuning sound parameters transmitted to both ears ON/OFF
F7	Turns the tuning sound parameters transmitted to the right ear ON/OFF
Up arrow	Increases the sharpness of the masking noise
Down arrow	Decreases the sharpness of the masking noise
Left arrow	Decreases the center frequency of the masking noise
Right arrow	Increases the center frequency of the masking noise
End	Decreases the masking noise volume for the left ear
Home	Increases the masking noise volume for the left ear
Page Down (PgDn)	Decreases the masking noise volume for the right ear
Page Up (PgUp)	Increases the masking noise volume for the right ear

5.2 Settings

The image shows a 'Settings' dialog box with the following elements and callouts:

Callout	Setting Name	Value
1	Minimal Q factor	0.01
2	Maximal Q factor	2
3	Minimal center frequency	250
4	Maximal center frequency	12000
5	Number of slider steps	100
6	Number of grid rows	12
7	Number of grid columns	20
8	Sound file (wav)	te-noise_48K_stereo.wav
9	Maximal Volume	-10
9	Minimal Volume	-50
10	Filtering stages	2
11	Buttons	Apply, Cancel
12	Debug	<input type="checkbox"/>
13	Start from the previous state	<input type="checkbox"/>
14	Restore Defaults	Restore Defaults

Additional UI elements include 'Apply' and 'Cancel' buttons at the bottom, and 'Debug' and 'Start from the previous state' checkboxes on the right side.

1. **Minimal Q factor** — the minimum “sharpness” value (corresponds to the lowest position of the Q slider, whose range is between 0 and 50).
2. **Maximal Q factor** – the maximum “sharpness” value (corresponds to the highest position of the Q slider, whose range is between the Minimal Q factor and 50).
3. **Minimal center frequency** – the value that corresponds to the left-most position of the F “frequency” slider (must be positive and less than the maximum center frequency; measured in Hz).
4. **Maximal center frequency** – the value that corresponds to the right-most position of the F “frequency” slider (a positive integer between the Minimal center frequency value and 24000).
5. **Number of steps** – the number of increments in the slider. The larger the number, the more precise the slider value.
6. **Number of grid rows** – the number of rows in the grid (an integer between 0 and 31).
7. **Number of grid columns** – the number of columns in the grid (an integer between 0 and 17).
8. **Open Input wav file** – the file of the prototype Masker sound.
9. **Maximal Volume** – the maximum value that corresponds to the right-most position of the volume slider (an integer between the Minimal Volume value and 0).
10. **Minimal Volume** – the minimum value that corresponds to the left-most position of the volume slider (an integer between -90 and Maximal Volume).
11. **Filtering stages** – the number of filtering iterations applied to the Masker signal (represented by an integer between 1 and 3). The larger the number, the more refined the masking noise will be with the same Q (sharpness).
12. **Start from the previous state** – indicates the mode in which the application will start. If checked, it will start playing the Masker sound immediately upon application launch. If left unchecked, TinnMasker will always start with sound switched OFF.
13. **Restore defaults** – returns TinnMasker settings to their factory defaults.

Debug – the mode for finding and resolving issues within the application. Using this mode displays two additional options on the main screen:

“Save audio file” saves the Masker noise based on the most recently defined parameters

“Bypass” plays the original Masker sound

6. Feedback and Updates

We would be happy to hear from you. Please leave your feedback on our Web site:

<https://www.wearandhear.com/tinnitus/feedback01/>

The latest application update can be downloaded from the link below:

<https://www.wearandhear.com/tinnitus/>

7. Contact Us

7.1 e-Mail

General inquiries: info@WearAndHear.com

Technical support: support@WearAndHear.com

7.2 Phone Numbers

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Fax: +972 4 8580 621

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