Visual Feedback for enhanced Singing Training
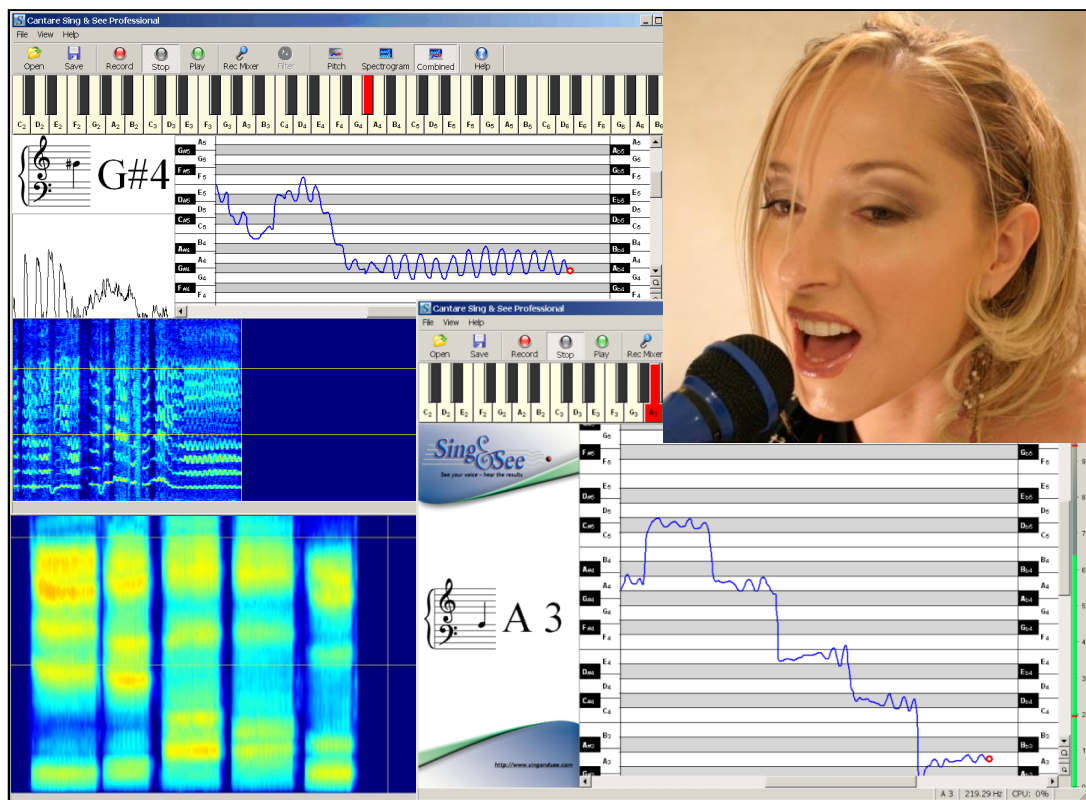
Getting Started with

SING&SEE

Sing & See is a tool that will help you develop the quality of your voice by giving you precise real-time visual feedback on your pitch and vocal timbre. The feedback shows you what your voice is doing as you sing, helping you focus on specific areas: your pitch, your vibrato, your loudness, or details of the harmonics (overtones) in your voice.

The following pages will guide you through the installation of Sing & See on your computer and help get your singing training started.

For further details on using the software to improve your singing, please visit our website: www.singandsee.com

Contents

What is Sing & See?

Sing & See – visual feedback for voice training – is designed for singers and singing teachers as a computer assisted learning tool to enhance their learning.

Sing & See enables you to accurately see what your voice is doing through a computer display. The singer and teacher can instantly see what's being sung – and make sense of it in a musically relevant framework. This direct visual feedback enhances the spoken feedback that teachers can give their students, and allows singers to see patterns in their voices that they may otherwise not be able to perceive.

If you are a singer, Sing & See enables you to actually see what your voice is doing so you can analyse their performance – once while you are singing, and then again while your singing is played back. The singing software contains sophisticated algorithms that analyse the voice to work out what pitch is being sung. It is then displayed on the computer screen in musically relevant displays. If you are a singer, it will help you gain a deeper understanding of how your voice "fits" into the musical structure.
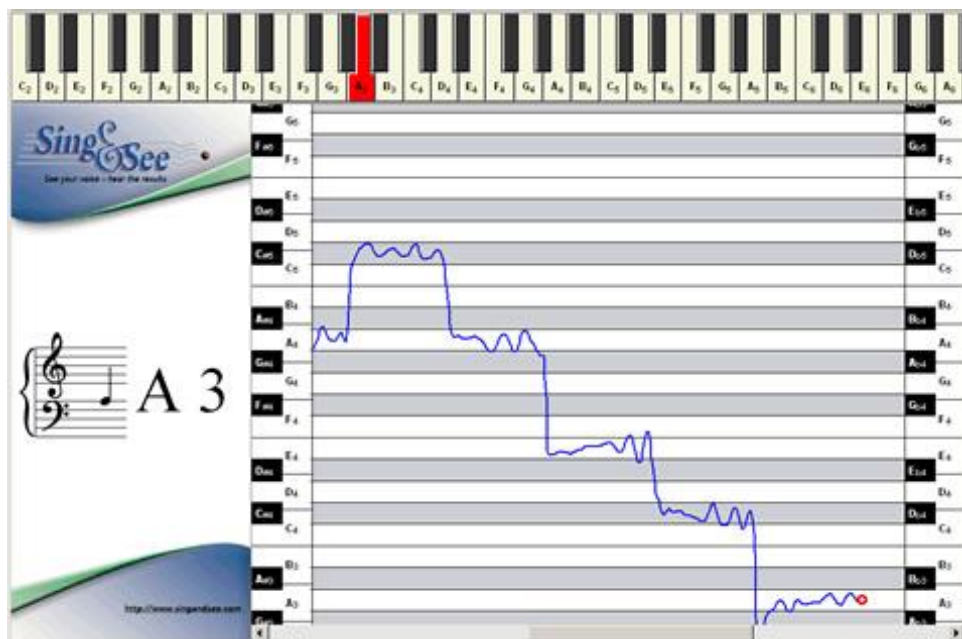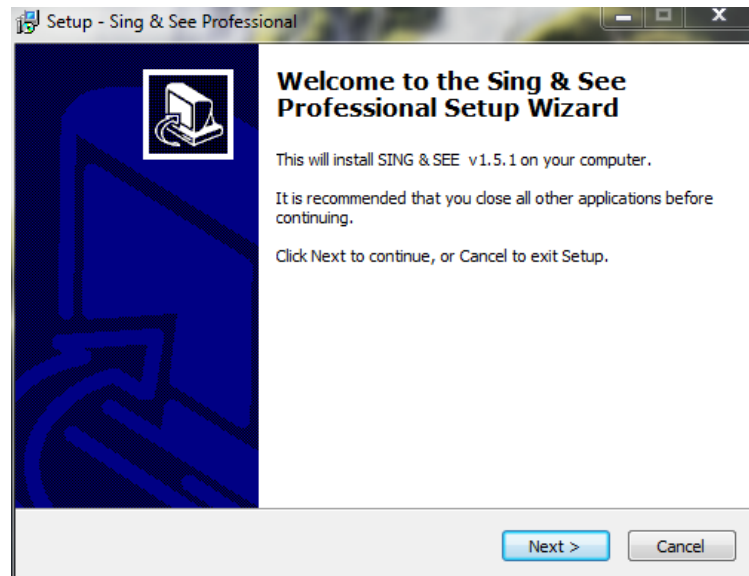

Above: Sing & See Pitch trace showing accuracy of the notes sung, development of vibrato, and how the voice transitions from note to note.

Installing Sing & See

Windows

You will have an installer file that you either downloaded or obtained on a CD-ROM. When you run this installer, it will guide you through the installation process.

Note: If you have Windows 7 or later, you will be prompted to authorize the install program to make changes to the computer. Click "Yes".

 Click "Next" to proceed through the installation steps. You will need to agree to the licensing terms, and can leave the options to their defaults unless you wish to change the location of the installed program.

The final step allows you to run Sing & See straight away. Otherwise you will find it in your "Start" menu.

Mac

You will have downloaded an install disk, or have a CD-ROM. Either double click on the install disk or insert the CD-ROM to open the install files in your finder.

To install, simply drag the Sing & See app to your Applications folder.

NOTE

The first time that you run Sing & See there may be a delay of 10-20 seconds as the software environment is set up. You will see a message box such as the following appear:
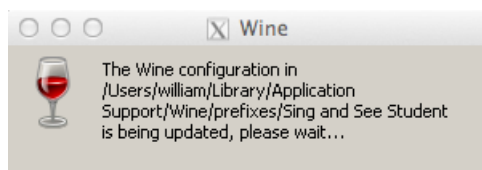
Wine

On the Mac Sing & See makes use of the "Wine" package to provide a "fake" Windows environment for the program to run in. You may therefore see both the Sing & See and Wine icons appear in your dock as the program starts.

The Sing & See menu appears at the top of the actual Sing & See Window, rather than the top of the screen (i.e. similar to on Windows).

To exit Sing & See, you need to click in the red close button on the window frame, or select "File->Exit" from the Sing & See menu – unfortunately the usual "command+Q" keyboard shortcut does not work.
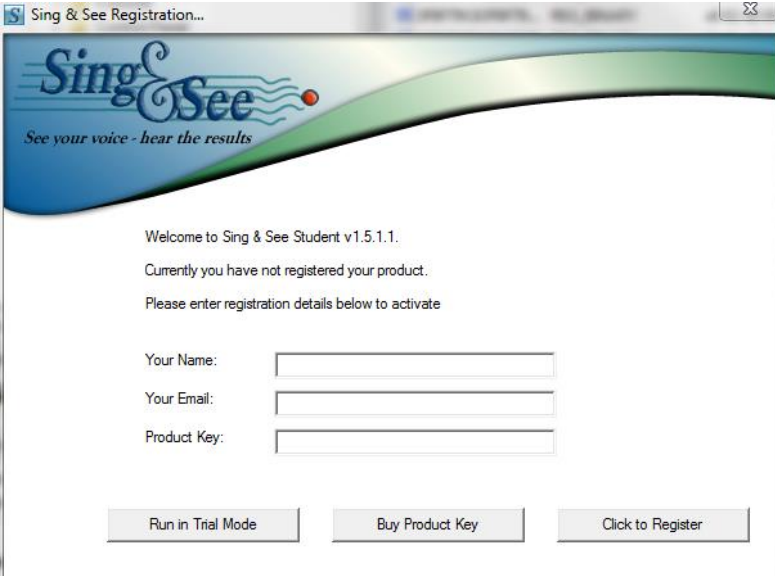
Registration

The first time you run Sing & See you will be asked to register your copy. You may skip this step if you are testing the application.

> Note: Once the software is registered, the Product Key is considered "Used" and cannot be refunded. If you are testing, click on "Run in Trial Mode". You have up to 30 days to test the application.

1. Enter your personal Product Key. This will have been provided to you when you purchased the software:

   o If you purchased a CD-ROM the Product Key is printed on the CD cover slip

   o If you purchased Sing & See directly from our website, the Product Key will have been e-mailed to you, and you can access it by logging into your Sing & See account page.

   o If you obtained your copy of Sing & See from your teacher, choir or school you should have been given a Product Key.

2. Enter your name and contact email so that we can notify you when we update the software. Note that the name you enter is used to personalise your installation of Sing & See.
   For your privacy we will not sell or disclose your name or email to any 3rd parties.

3. After you click the "Register" button, the registration information is uploaded to our registration server and the Product Key is checked for validity. A unique activation code is then downloaded and installed on your computer, in order to activate your copy of Sing & See.

NOTE: If your computer is not connected to the internet, you will need to get online on another computer and download an activation code from www.singandsee.com/register_online.html. You will need your Product Key and the Hardware Signature from the Sing & See "About" page. You can save the new Activation Code to a removable disk to transfer it to the computer where you have saved Sing & See.

Setting up Sing & See on your Computer

Microphone

Plug the microphone into the microphone socket on your computer. This is almost always marked with a small microphone symbol. If you are unsure, please consult your computer's documentation.

USB Microphone

A USB microphone or USB headset can usually be simply plugged into your computer and it will recognise it automatically and install the appropriate drivers.

External Audio Device

If you have an external audio device, make sure that you first install it according to the manufacturer's instructions and test it so that you know that it is working. You may have to restart your computer after installing a new device. When using external devices you may have to make sure that Windows is using your external device as its "Preferred device".

Microphone Selection

Sing & See utilises the default recording device. Usually this is the standard or USB microphone that you plugged in. But if you have more than one microphone device (for instance a web-cam or built-in laptop microphone) you need to check that Windows has selected the microphone you want to use.

Windows XP

Open the "Sounds and Multimedia" control panel. You can get to this by clicking "Start"->Settings->Control, or from the "Options->Audio Control Panel" menu item in Sing & See.

Click on the "Audio" tab and on the middle of that panel there should be a pull-down choice for "Sound Recording" - "Preferred device:" With that you should be able to choose your audio device (if you have more than one installed, make sure that you choose the one connected to your microphone).
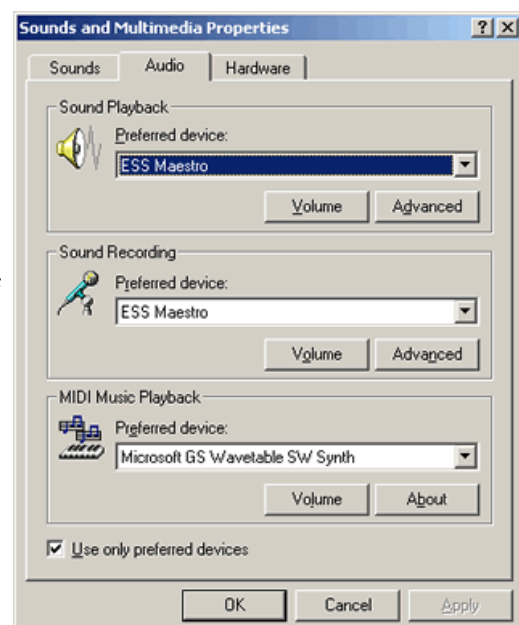
Windows 7 and above

Open the "Sound" Control panel.

You get this either by clicking on the "Options->Audio Properties" menu in Sing & See, or from the Windows Control Panel – click on "Start", then Control Panel, then "Hardware and Sound".

You may have more than one Microphone device listed on the "Recording" tab. Ensure that the one you wish to use for recording is set as the "Default Device".

Note you can also choose Speakers or Headphones from the "Playback" tab.
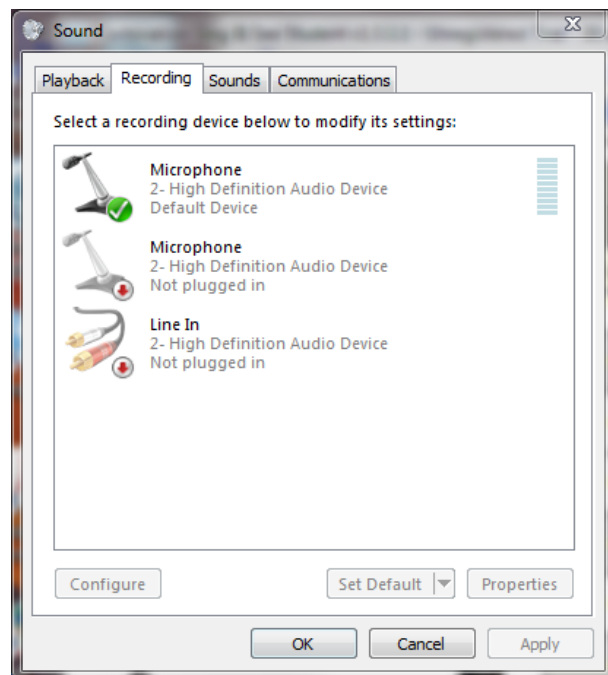
Mac OS X

On the Mac, you select the audio input from the System Preferences "Sound" panel: click on the "Input" tab and make sure that your desired microphone is selected.

Note that if you plug in a normal external microphone (i.e. not a USB microphone) then you need to select "Line In" so that it is chosen instead of the built-in one.

You can also adjust the microphone input volume on this Preference Panel.
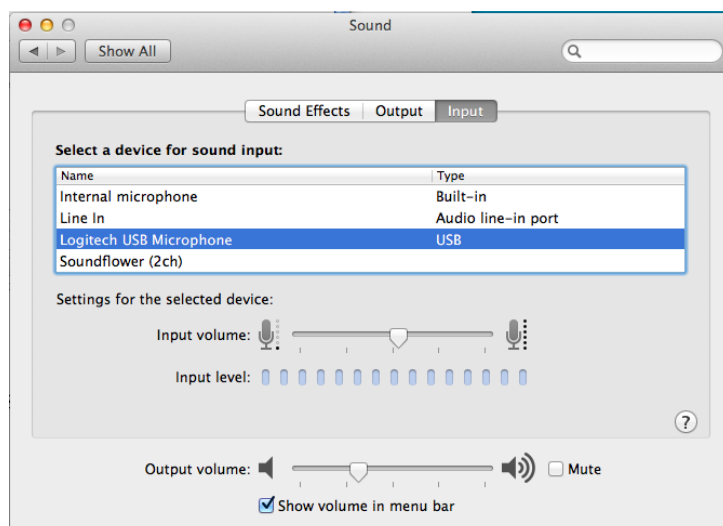
Recording Volume

Windows XP

Windows XP has a "Recording Mixer" that you can use to control the volume of the microphone input.

Click on the "Recording Mixer" button on the toolbar in Sing & See. This should open the "Recording Control" panel with several sliders to control the volume of each sound source.
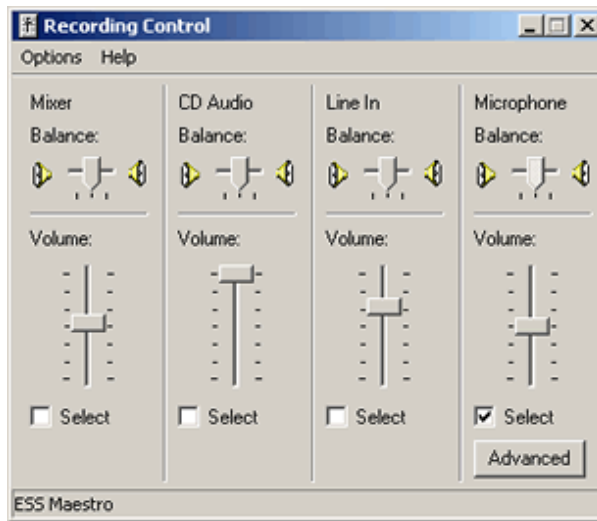
Along the bottom is a row of check-boxes which you use to select the particular source that you want to record from. If you are using the microphone, make sure that the "Select" check mark is under the column labeled "Microphone". Also, make sure that the "Volume" slider is set to around the half way mark.

If the recording volume is too high or too low, adjust this slider. On some computers you may also need to click on Advanced and adjust the "Microphone Boost".

Windows 7 and above

In Windows 7 and Vista, the recording volume is controlled by a slider in the Sound control panel.

First, select the microphone input on the "Sound" control panel and click on the "Properties" button.

This will open up a properties page with a number of controllers.
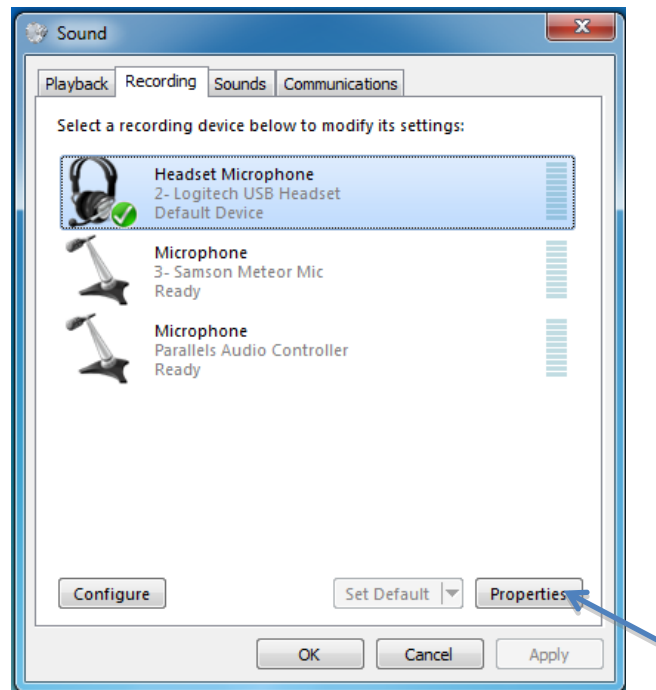
On the Properties panel, click on the tab that is labeled "Levels".

On the "Levels" tab, there is a volume adjust slider and possibly (depending on your computer hardware) a Microphone Boost slider. You can adjust these to change the sound level.

Have Sing&See open and recording, then adjust the microphone volume level so that the Sing&See level meter reads about 8 at your highest loudness.
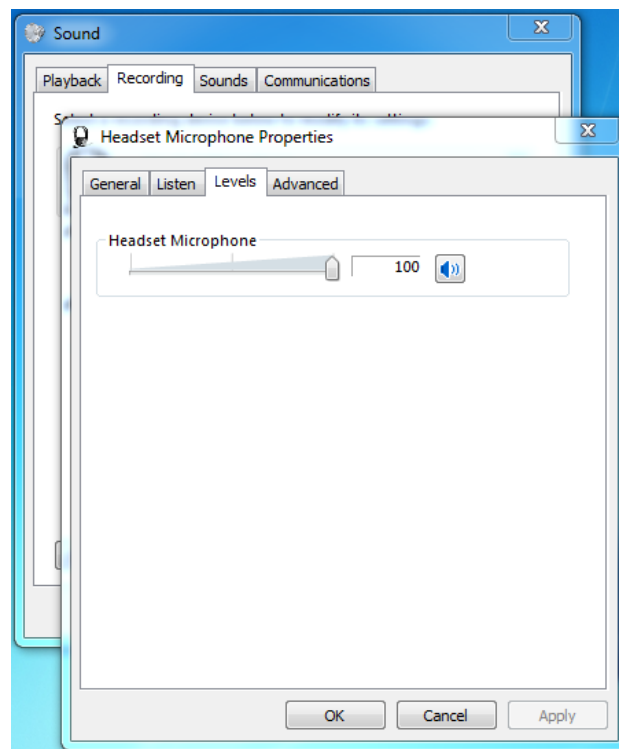
Start using Sing & See

While it is obviously possible to analyse and improve your own performance with this program, Sing & See is best used in collaboration with a singing teacher. Either way, analysing your voice with the program will allow you to try different things with your voice, and develop in technique and style.

Pitch Trace Display

The Pitch Trace Display shows your pitch as a continuous blue line on a graduated scale.

The vertical direction indicates pitch, with the time slider moving from left to right. The red dot shows the latest pitch detected, and the blue line trailing behind it indicates the changes in pitch over the last few seconds.
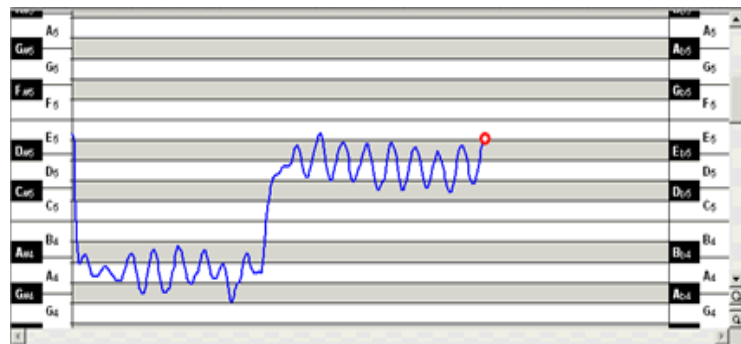
As you sing, the red dot indicates the pitch of what you are singing as you sing. During replay mode, the red dot indicates the pitch of the sound as it is being played. Replaying your singing will allow you to analyse your performance – your pitch and its steadiness, and your vibrato.

The dark and white bands on the display indicate the black and white keys on the piano. These are labelled on the left and right of the display for easy reference, with flats indicated on the left and sharps on the right.

The range of pitch that is shown at any one time can be changed by scrolling and zooming with the bar along the right side of the display.

To move the range up or down, point the mouse pointer to the scroll bar on the right, click and hold down the left button, and drag the mouse pointer up or down.

If you have a mouse-wheel you can scroll the range up and down by rotating the mouse wheel. On Mac iPads and some Windows touchpads you can use two-finger swipe motion to scroll pitch.

To increase or decrease the pitch range displayed, click on the small magnifying glass icons shown at the lower right corner of the screen.

With a mouse-wheel, hold <CNTRL> and rotate the mouse wheel to zoom the range of pitch displayed.

Using the Pitch Displays

Because the pitch displays need to detect the pitch of your voice, they work best for vowels. Consonants are generally excluded by the analysis algorithm, but can cause the display to "jump around" if the software notices random pitches in the sound.
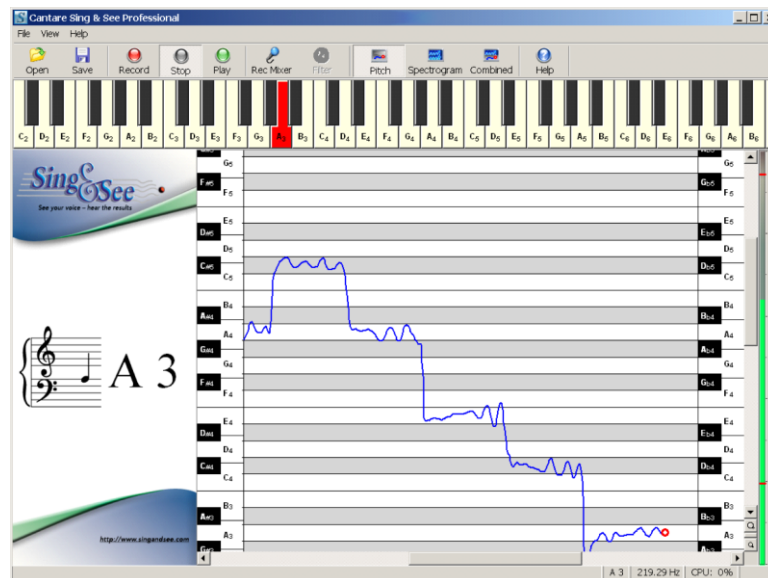
- Try sustaining a single note in a pitch that is comfortable for your voice. Watch to see whether the blue pitch trace stays within the borders of the single note you chose to sing. This can tell you how steady your pitch control is.

- Play the note on the piano keyboard and try singing that single note again, and see how well your pitch relates to the core of the note. Compare the pitch of your singing voice with the note played on the piano.

- Sing an arpeggio starting on that note, and watch the notes that you sing. Did you reach the right notes? Were the notes steady? How smooth were the transitions between notes?

- Observe your pitch accuracy, stability and vibrato. Check how easily you move from one note to another.

- Talk to your singing teacher about specific exercises to help improve your voice. Depending on your needs, your teacher will recommend different things for you to work on. Using Sing & See will allow you to analyse your performance and potentially could help you develop techniques faster than normal.

Voice Spectrogram Display

The spectrogram shows a scrolling image of how the power in the voice is spread between all the frequencies, from low frequencies at the bottom to high frequencies at the top of the display. The display measures time from left to right, so that an image of how the voice looks while you are singing gradually appears.

Each line indicates a harmonic (also called "overtones")
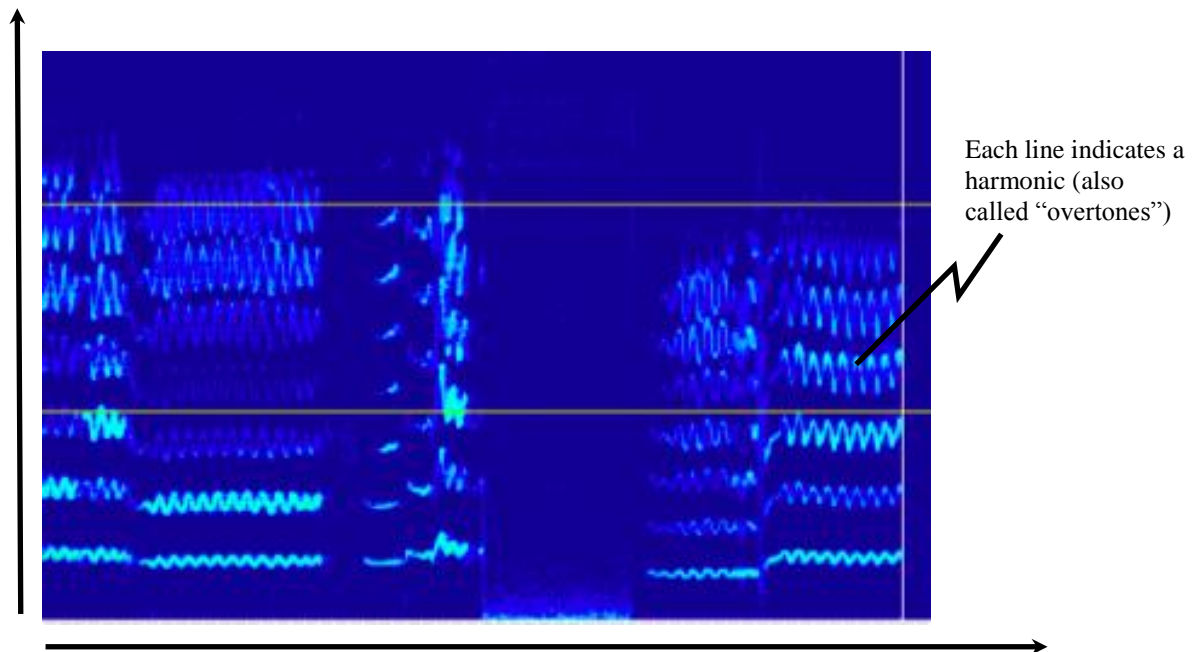
The leading vertical line indicates time as it happens. When it reaches the right end of the display, it scrolls right around to the left edge and starts moving across the display again.

The frequency range of the display is from 0 (at the bottom) to 5kHz (5000 cycles per second) at the top. The horizontal lines drawn on the display show 2kHz and 4kHz.

The brightness of the image represents how much energy appears at that frequency in the voice sound.

You can change the colours used by means of the options in the View Menu.

Using the Spectrogram

The spectrogram display in Sing & See provides singers with a visual representation of the harmonic structures in the voice as you sing. Spectrogram analysis separates out the voice harmonics (termed the spectrum) and displays these as a vertical slice at each moment in time (time moving in the horizontal direction).

- The spectrogram can show the presence of the "singer's formant" as a bright band of energy between the horizontal 2 and 4kHz lines (especially about 3kHz and upwards). The brightness in this middle part of the spectrum
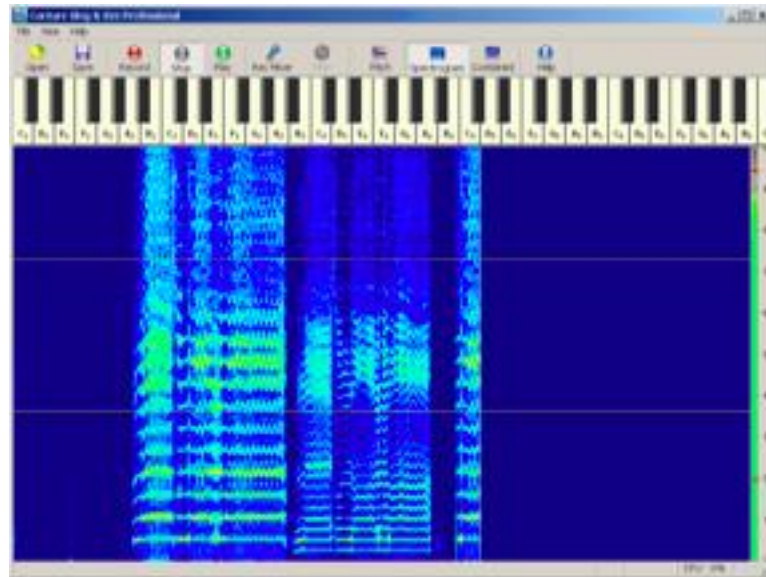
  reflects the strength of your singer's formant. The singer's formant is the reason that a single operatic voice can be heard above an orchestra, as trained opera singers often have a resonance peak around this area. The spectrogram will allow you to evaluate your own voice in this way.

- Singing a vowel sound, you can observe the harmonics (overtones) of your voice. The brightness of each of these will change for each vowel and may change as you sing a vowel through a range of pitch.

- You can see vowel patterns more easily by selecting "broadband" analysis in the Options menu.

- Breathiness in the voice is indicated by "noise" appearing between the harmonics of the voice.

- With onsets, look for a clean start to the phonation with a clear harmonic pattern.

Sing & See Contact Details

Contact details:
Sing & See
CantOvation Technology
PO Box 340-176
Birkenhead, Auckland 0746
NEW ZEALAND

www.singandsee.com

support@singandsee.com

Sing & See Community Pages

Share your stories of how you are using Sing & See in your voice training, report any problems or make suggestions for improving the software:

www.singandsee.com/community