

A Short Guide to Good Microphone Recordings

V 0.1

17th April 2011

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Here we are concerned with vocal (and not instrumental) recordings. The setup is as below -

Setup

A mic connector connects the microphone and the PC sound card. We are using [XLR connector](#) on the mic side and [TRS connector](#) on the jack side. We have two models of mikes Sony F-V420 and Shure-SM58.

Recording instructions –

1. Turn off fans / AC in the room to avoid any background noise. Ask everyone around to keep quiet. Make sure that the CPU fan noise is not affecting the recordings.
2.
 - 2.1. On Windows-XP
 - 2.1.1. Go to **Control Panel**. Double-click **Sounds and Audio Devices**
 - 2.1.2. Click on the Audio tab. Here you will see volume settings for headphone, mic etc. [Fig 1]
 - 2.1.3. Click on **Volume** under *Sound Recording*. This will open the Recording Control window. [Fig 2]
 - 2.1.4. Set the Mic Volume slider to maximum.
 - 2.1.5. Click on **Advanced** below the Mic Volume slider. Make sure that **Microphone Boost** option is checked; otherwise the recording will have very low volume. [Fig 2]

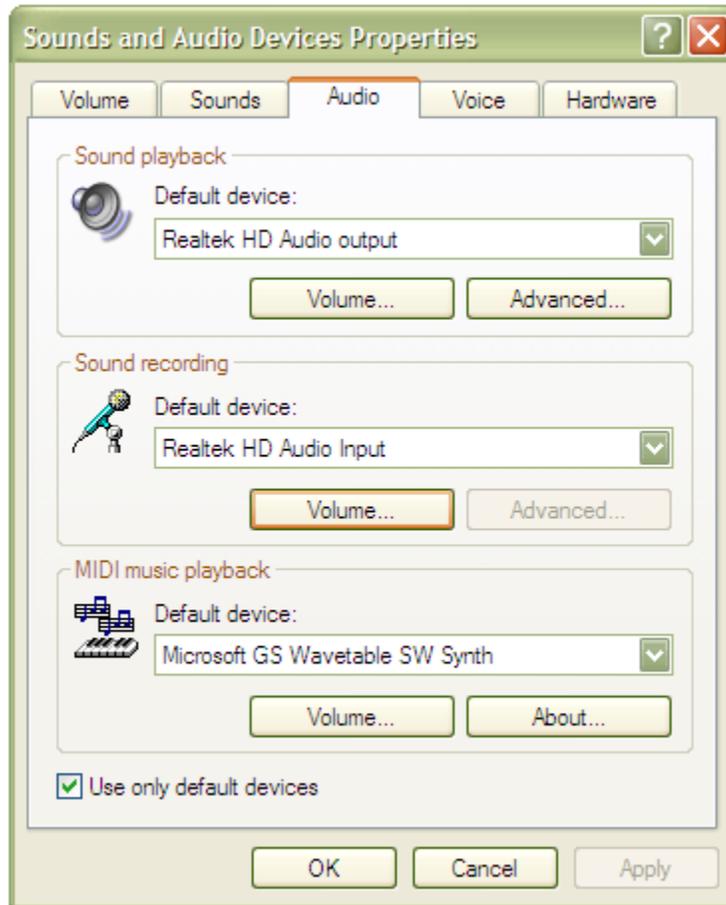


Figure 1 - Audio devices settings

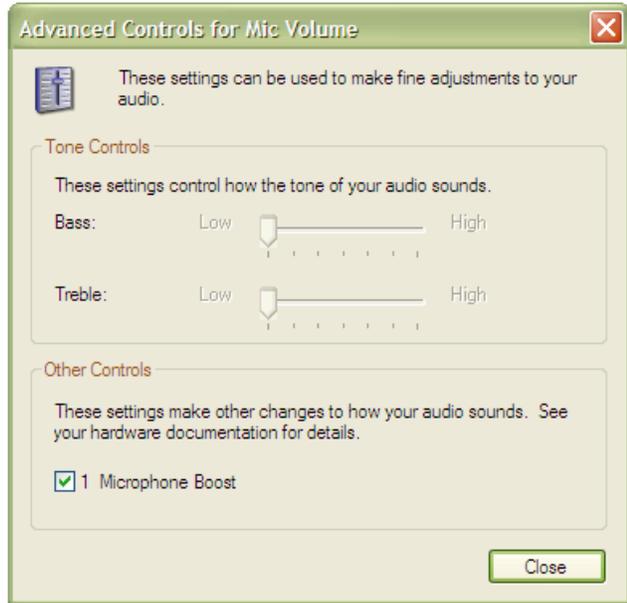
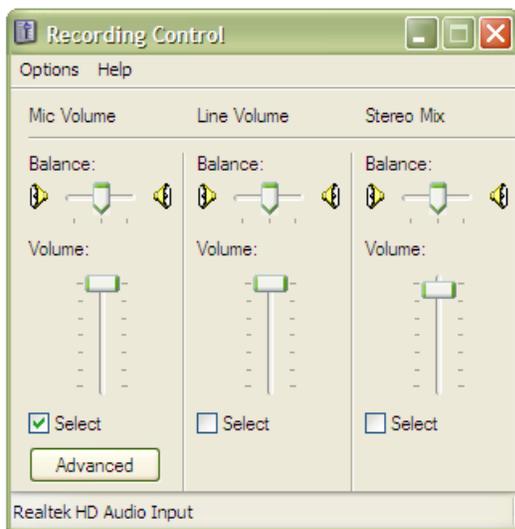


Figure 2 - Normal and advanced recording settings

2.2. On Windows – 7

- 2.2.1. Go to Control Panel. Select **Hardware and Sound**.
- 2.2.2. Click on **Manage audio devices**. [Fig 3]
- 2.2.3. Select **Recording** tab. Double-click on Microphone (green check indicates that the mic is connected.) This will open **Microphone Properties** window. [Fig 4]
- 2.2.4. Select the **Levels** tab. Here [Fig 5] under “Microphone” you can see the volume slider. Set it to maximum.
- 2.2.5. Unlike Windows-XP here various “Microphone Boost” levels are possible. Choose +20dB level.



Figure 3 - Hardware and sound options

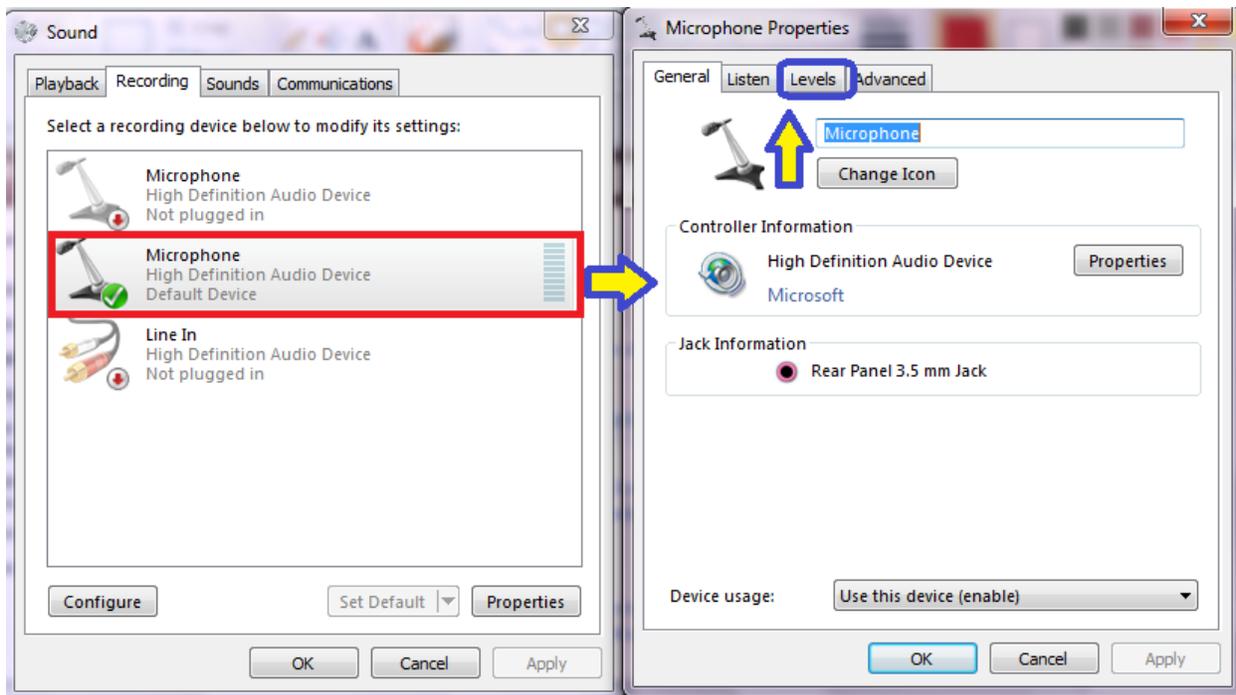


Figure 4 - Recording devices and microphone properties

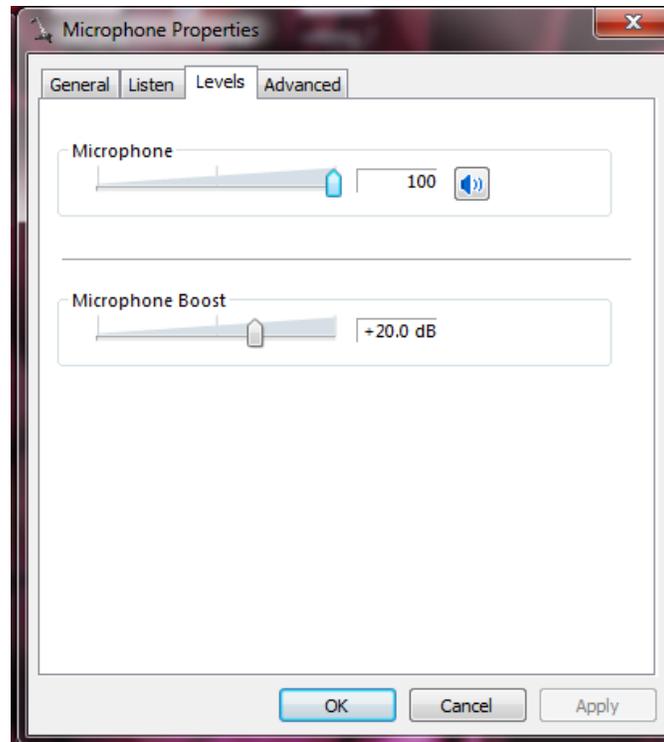


Figure 5 - Microphone levels

2.3. How to hold the mic?

Use the mic stand to avoid handling noise. Keep the mic at a distance of 2-3 inches from your mouth. If the mic is unidirectional, its axis should point to your lips.

Do not keep the mic pointing at your nose as it will make the recording nasalized.

Do not touch the head (ball grill) of the mic.

Make sure that relative position between your mouth and the mic remains the same throughout the recording (i.e. don't swing back and forth / wave the mic around if held in hands)

2.4. Recording using Cool Edit software [Audacity instructions will be updated later]

Note: You may study "Intro to Cool Edit" from here

<http://vk6hgr.echidna.id.au/warsug/tutorials/introcooledit.pdf>

[Local copy for above- <http://home.iitb.ac.in/~pranavj/introcooledit.pdf>]

Cool Edit Pro manual is here http://home.iitb.ac.in/~pranavj/CoolEditPro_2_manual.pdf

2.4.1. If your mic has a switch, turn it on.

2.4.2. Open Cool Edit.

2.4.3. Click on the Red button for recording near bottom of the window. This will throw up a **New Waveform** window. Here you can set Sampling rate, number of channels, bit resolution etc. [Fig 6]

2.4.4. Click **OK**. This will immediately start recording.

- 2.4.5. Observe the background noise level. Now say something. On the right hand side you will see the sample value scale. (If there is 0 – 1 scale, you can right click on it and select **Sample Values** option.) *Make sure that the max speech amplitude is at least 40% of the maximum value of the scale.* To get high SNR (ratio of signal power and noise power) it is important that background noise floor is very small.
- 2.4.6. On Windows- 7, if you observe that noise level is too much, you may reduce the “Microphone Boost” level. If you observe that the mic is saturated [Figure to be added], reduce the mic volume.

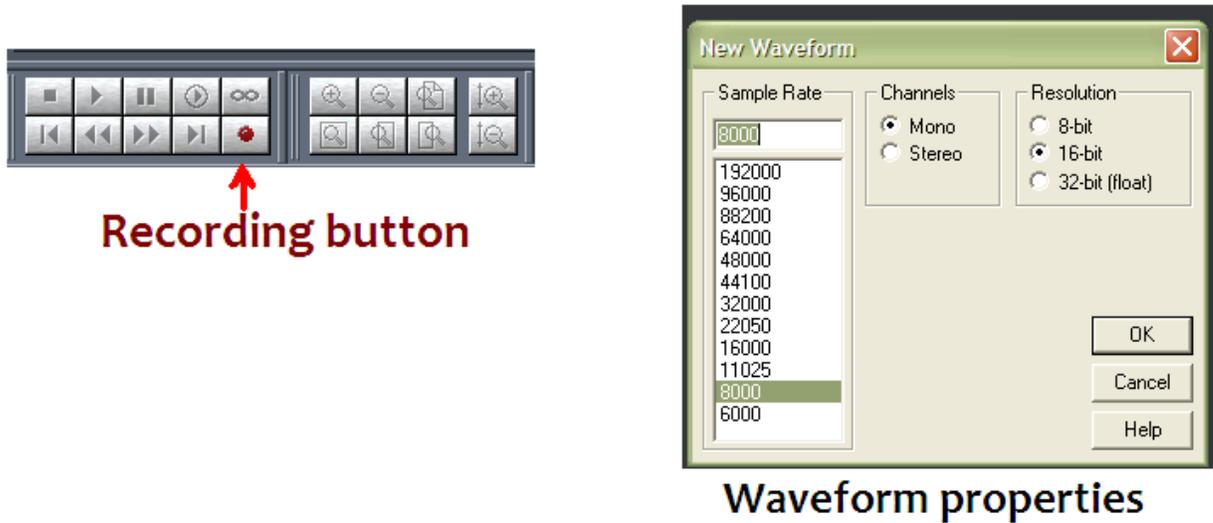


Figure 6 - Recording using Cool Edit

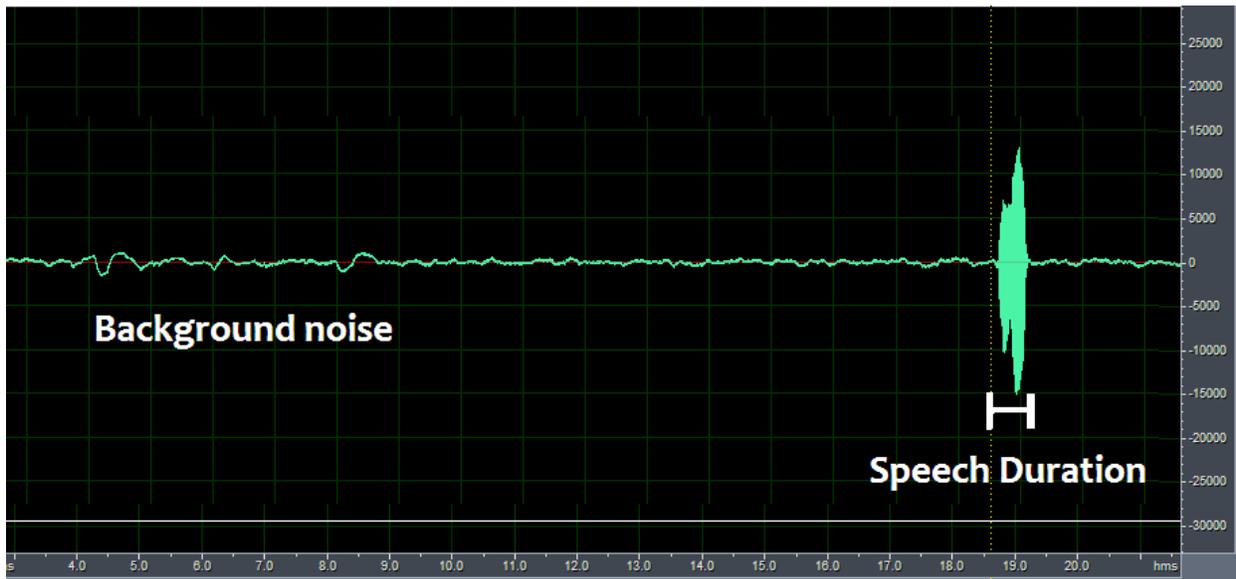


Figure 7 - Recorded waveform using Cool Edit

Mic saturation example

Following waveform was recorded using an old Sony F-V420 (<http://www.sony.co.uk/product/pam-vocal/f-v420/tab/technicalspecs>) mic. The waveform got clipped at ~18000 sample value. To avoid this mic volume should be reduced. The Shure SM58 mic did not show this clipping problem.

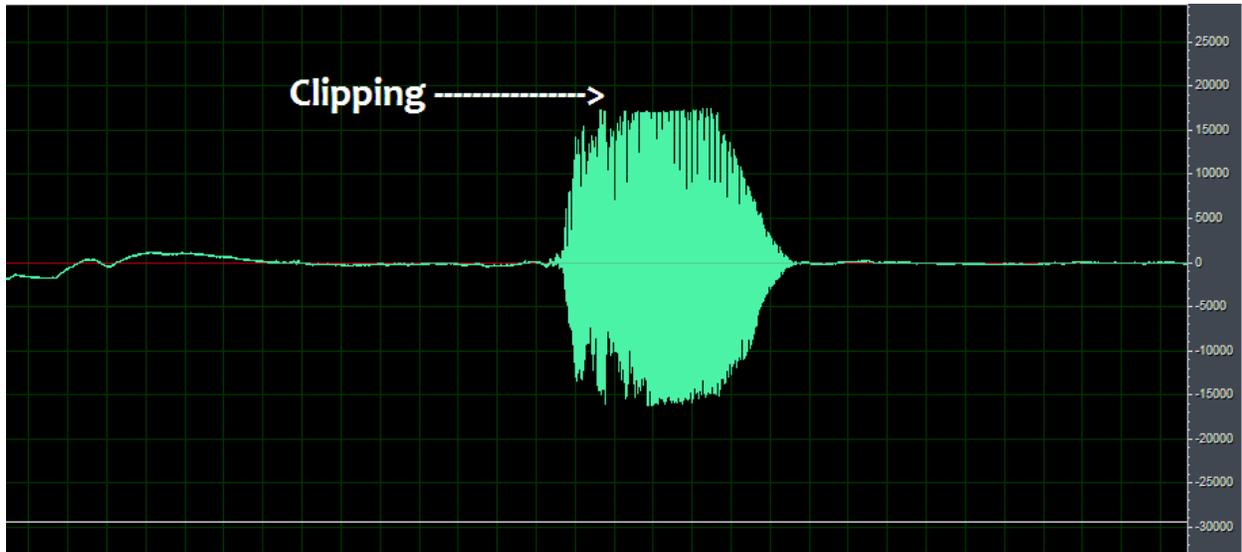


Figure 8 - Mic saturation

Tips from SM58 user guide

Please refer to - <http://home.iitb.ac.in/~pranavj/sm58ug.pdf>

Some useful links

1. **Introduction to sound recording**, online textbook by **Geoff Martin**
Link1- HTML <http://www.tonmeister.ca/main/textbook/>
Link2- PDF http://www.musicoff.com/Files/Intro_2_SoundRecording.pdf
2. [4 Simple Tips for Recording High-Quality Audio](#)
3. [Microphone technique](#)
4. [Digital Audio Field Recording Equipment Guide](#)
5. [Equipment for Audio Recording of Speech](#), University College London, Division of Psychology and Language Sciences
6. [Intel® High Definition Audio](#)
7. A blogpost on soundcards <http://shinesystems.blogspot.com/2010/05/sound-card.html>
8. [“Miking the vocals”](#) article in Shurenotes
9. [How Do Microphones Work?](#)
10. [“Mic types & characteristics”](#) an article in SoundOnSound magazine